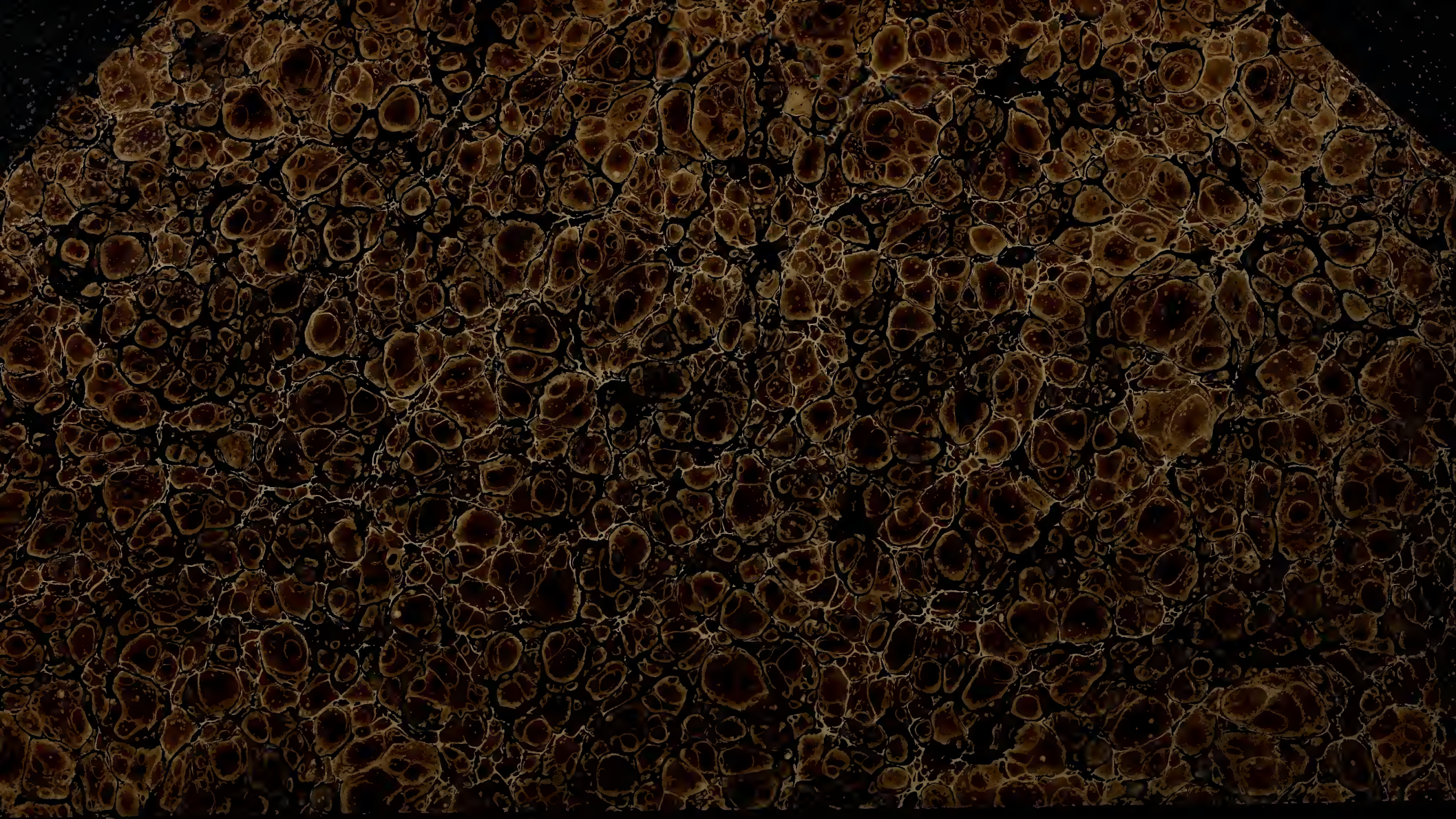

THE

DENTAL TIMES,

A

QUARTERLY JOURNAL

OF

DENTAL SCIENCE.

EDITED AND PUBLISHED BY

THE FACULTY

OF THE

Pennsylvania College of Dental Surgery.

VOL. VII.

PHILADELPHIA:
1870.

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THE

DENTAL TIMES.

VOL. VII. PHILADELPHIA, JULY, 1869. No. 1.

Original.

DENTAL HYGIENE.

BY SAMUEL WELCHENS, D. D. S.

[Read before the Pennsylvania State Dental Society, at Harrisburg, June 8th, 1869.]

The importance of a good hygienic system in the several branches of medicine cannot be over-estimated. To preserve health should claim the attention of science, fully as much as the means of restoring it when impaired or lost. The physiological relations of the various parts of the human structure are so nicely balanced, while the elements of life and death are in such close proximity, striving continually for the mastery, that the highest attainments in professional skill, and the broadest and most comprehensive experience should be brought into requisition, in order to keep the phenomena of *vital activity* in channels of health and happiness. *Dental hygiene*, though to some extent a specialty, partakes in a very large degree of the element of dependency. It involves some of the most important functions, and must, from the very nature of the case, be conditioned and influenced by the general laws of the economy.

The capillary network, which derives its nourishment from the systemic circulation, constitutes the source of vitality to the teeth, and to keep it in an active, healthy condition, so as to perform its functions properly, and build up and establish those hard unyielding structures, and develop, in the process of growth, a strong and enduring denture, is the subject of our present inquiry.

The human teeth are of that class of organs which are not in any direct relation with the blood-vessels, and yet which derive their whole nutriment, and the materials of their functional operations, from the blood. In all other respects they are almost a separate and distinct creation. They begin to form, and become developed, when all the other organs are already faithful to the wants of the economy, and are destroyed by disease and decay with but little serious inconvenience to the system.

While they are regarded as the hardest organic substance known, hey are by no means the most durable. By their superior structure, they were evidently intended by nature to withstand all the wear and tear of mastication. But, apart from this, they are destined to sustain shocks and trials from internal derangements and external abuses, so that the office allotted to them is performed between two most powerful engines of destruction.

The rule seems to be, so far, at least, as external usage is concerned, neglect and violence ; and, where this is not directly the case, with regard to the teeth, their low vital powers are driven in upon themselves from the surface, by some congealing agent, or raised to a state of inflammatory excitement by acids and corrosive applications, fully as destructive to their general health.

This kind of abuse is a fruitful cause of decay, but it obtains as much among those who are scrupulously cleanly, as those who are careless and filthy ; so that the popular theory that the decay of those organs is caused solely and entirely by external agents is, for the most part, erroneous.

Our purpose, in this paper, is to combat this theory, and maintain that the cause of decay in the teeth is attributable to internal derangements and an insufficiency of capillary nutrition, fully as much, if not more, than to careless habits and the various causes of external abuse ; not, however, for the purpose of disparaging sanitary measures, but to direct, if possible, attention to the internal—so that our hygienic principles may apply and benefit the race from both stand-points and in both theories.

I hold that there are three several conditions of the economy, in which it is possible to so derange the functional powers as to superinduce a corresponding derangement of the capillary nutrition in the tissues ; and the complex organic nature and structure of the teeth being such as to deprive them of a rapid recuperative action, *stagnation*, leading to *decomposition and decay*, is the result.

The first of these conditions is that pathological state produced by mesenteric derangements and eruptive fevers incident to child-bed, whereby there is an undue consumption of capillary nutrition, and an inability on the part of the tissues to appropriate proper aliment, which produces not only weak and delicate teeth, about the time of their formation, but the unsightly deformity of what is termed *dental atrophy*.

The second condition is an enfeebling or weakening process in the systemic circulation, by which the function of assimilation is retarded or defeated altogether, especially in the hard tissues of which the teeth are composed, and thus rendering them soft and liable to disease and decay.

The third condition or element of decay in dental tissue arises from an undue acceleration of the local circulation, producing active congestion in

the soft tissues, a gorging or choking of the vesicles by a too rapid interstitial deposit of the mineral substances, designed by the economy to harden the teeth.

The foundation of a building, or the fountain-head of a stream, must possess the ability to sustain that which depends upon it. The root of a plant must have absorbing surface to supply the wants of the stem and leaves. These are *axioms*, which will readily illustrate the absolute necessity of sufficient vital energy in the circulating system of the animal to supply a proper amount of nutriment to stimulate the entire capillary maze.

In all organic structures there are central or vital organs which supply functional power to those which are thrown to the surface, and the arrangement is always to have those organs deeply seated for their own protection, and that each succeeding strata of the fabric, as the growth is outward and upward, becomes more complex, and consequently less liable to injury, but at the same time less capable of recuperating their power when injured.

This general law of the economy is well-settled and most beautifully illustrated in the arrangement and formation of the human teeth.

The "*cementum*" or "*crusta petrosa*," the "*dentine*" and the "*enamel*" constitute the three several divisions of the dental tissue, and the arrangement gives the *cementum* the position nearest the vascular tissue, because of its better adaptation to hold the fluid thrown in from the blood to be imbibed by the capillaries of the more highly organized structure of the *dentine*. And then, again, the *enamel* being still more dense, and less liable to injury by reason of its low vital organization, comes boldly to the surface, and finishes the grandest structure of the animal economy.

The cementum contains about one-third per centum of animal matter, thus rendering its "*lacunæ*" and "*canaliculi*" capable of retaining, and, to some extent, elaborating, the fluid which is secreted from the *periosteum* to nourish the *dentine*, by the process of *endosmosis*, or *imbibition*. This structure, then, is that which holds the destiny of the entire tooth. The ability of the organism to keep the *dentine* in a healthy state by preserving a proper vital balance, is the very pith of our subject.

The dentine is, perhaps, the most delicately organized fabric within the entire range of the economy. Its capillary vesicles contain a fluid composed of the finest particles of the blood. This fluid is laden with the azotized compounds designed by nature to build up the tissue, and by virtue of its extremely delicate and sensitive character, it is easily influenced, either to a healthy, vigorous action, by a proper functional stimulant from the systemic circulation, or it can be disorganized, either

from the want of such a stimulant, or a too rapid interstitial deposit of its particles. These changes can take place through disease, a feeble organization, or external abuses.

In marasmus, catarrh fever, measles, or any of those diseases incident to childhood, the integrity of the blood becomes destroyed, capillary circulation and nutrition are interrupted and deranged. And when they are contracted about the time of the formation of the dental tissue, there is an insufficiency of mineral matter for a perfect development of the teeth, and especially of the enamel, and the result is that hideous malformation termed "*dental atrophy.*" Or a lack of *vital energy* may be superinduced from the same cause, and though there may be material enough to form a beautiful pearly denture, the organization does not go on vigorous enough to make it strong and enduring, and a soft chalky *enamel*, with a corresponding enfeebled *dentine*, is the result.

Sometimes, too, those pathological conditions are entailed from parent to child. This consumption of vital energy, and of capillary nutrition, thus becomes congenital, and that which is lost by the parent can never be regained by the child. The teeth always become involved in those defections, and can never be rendered strong and enduring in texture.

These are pathological conditions of the system, many of which must be allowed to run their course, and do their work of destruction. All the dentist can do is to apply his artistic skill, either in treating the natural organ, or supplying an artificial denture—there being no system of dental hygiene fully equal to the task.

We will therefore turn to our next element of inquiry.

An insufficiency of capillary nutrition, from whatever cause, will have a more damaging effect upon the teeth than any other part of the capillary system. A derangement of this sort in the epithelial and epidermic, and also the articular cartilage vessels, can be more rapidly overcome, by reason of the flexibility of their walls, and their adaptation to the laws of tolerance pervading the entire structure. But the denser and more highly organized fabric which composes the teeth, is not possessed of such rallying power, and consequently must suffer injury corresponding to the amount of damage to the other tissues, done by such irregularity; and, not being able to recover as rapidly as the softer tissues, the injury multiplies—disintegration is followed by disorganization and decay.

The operation of nature in the vegetable kingdom is analogous to this, and will serve to illustrate the idea we wish to present. So long as the root of a tree promptly answers the demands of the trunk and the leaves, all goes well; but when this supply fails, the foliage begins to flag and droop, and if this exhaustion proceeds beyond a certain point, the leaves wither and perish. If there is a deficiency or an irregularity of the absorb-

ing surface of the root, it may not destroy the entire foliage, but, "leaf by leaf it will droop and die." The teeth *can decay*, and in a majority of cases *do decay*, from similar circumstances.

The causes, in every instance of this deficiency of "*capillary nutrition*," cannot be discovered. It occurs in all grades and ages of the human race, and does not escape the robust and healthy any more than those who are constitutionally delicate.

Irregularities in the capillary circulation have been noted when the systemic circulation was in perfect condition. They are most frequent, however, when the heart's action is enfeebled or partially interrupted. And this can occur, and most generally does occur, through some of the abuses of the system incident to our modern mode of life. Dissipation, exposure, sudden and extreme changes in temperature and habits, improper and insufficient diet, tight lacing, careless and filthy living and customs, are among the primary and principal causes. Each and all of these irregular habits of life may produce great and sudden variations, either in whole or in part of the capillary network — the circulation taking place with diminished rapidity in one part, and increased energy in another, though both are supplied by the same trunk. These are not the results of a chronic pathological condition of functional power, but a sequence of their neglect and abuse.

Go into the candy shops, the fashionable hotels and boarding houses, and see the amazing consumption of dainties, well calculated to disturb the normal condition of the system, and, instead of being aliment for a healthy development of the tissues, they produce those debilitating results. Go into the festive social parties, and the brilliant entertainments and balls where so many of the young, particularly in our larger cities, almost live in seasons of gaiety and fashion—where the action of the larger organs is destroyed, and the functional power of the systemic circulation is retarded, and the vital energy of the system is driven back upon its centre by the half sufficient dress, the congealing efficacy of a piercing atmosphere, and unseasonable hours peculiar to such a life. Go into the haunts of vice and dissipation, and mark the manner in which this grand human structure is abused by those whose interest it is to preserve it, and you have a solution at once of the problem we are endeavoring to solve.

But come home, and see whether your little son or little daughter is not suffering the same loss of capillary nutrition and functional energy by close confinement, either in the house or at school, or by the use of too many candies, too much ice cream, or by being over-fed at table with too much sweetened bread and a corresponding round of rich pastry and dainty dessert, without a balancing supply of the more solid food. Here it is that "*dental hygiene*" should interpose its gracious offices, to regulate these

dissolute habits. Insist upon proper treatment in the case of children, and thus re-establish that measure of vital energy which our race is rapidly losing, by not knowing exactly how to live.

We may, however, be pointed to a class of people whose habits in life preclude the idea of their participation in any of those scenes of exposure and dissipation, or whose children are rarely indulged as above intimated, but yet where there seems to be fully as much decay in the dental tissues. Look at our sturdy farmers and woodsmen, and the suburban laborers and mechanics throughout the country. They and their children are, for the most part, strangers to those excesses, and seem to be the very embodiment of robust health and manly development, and yet they come into our offices with as much dental distress as those above enumerated.

With this class of people *sanitary measures* will go far, very far, toward a propitiation of dental decay, and in perhaps the majority of cases will prevent disease until there is a proper development and enduring texture produced in the tissues. But, with all the care that can be taken, all along through life, at every stage and period, they are confronted with the stern reality of an *exposed* and *aching pulp*, through the decay and breaking in of the crowns or walls of the teeth. Can all this be said to be the result of external agencies and injuries *alone?* May there not, after all, be some cause of a character purely and entirely *internal* from which such results may obtain?

We answer, that we believe that there is, and the theory which we hold on the subject will claim the principles we design to discuss in our third and last proposition, namely: the liability of teeth to decay through an undue acceleration of local or capillary circulation, from which there is a gorging or choking of the tissues, thereby interrupting functional power, and producing results similar to an enfeebling insufficiency of capillary nutrition.

In the tree, in the vegetable kingdom, for example, in seasons of active vegetation, leaves may be observed to wither, die and fall off, notwithstanding the fact that the foliage seems strong and vigorous. This is the result of an undue acceleration of the circulation of the sap. Those leaves become gorged and choked by a too rapid deposit of the saline and earthly particles designed by nature to build up the tissue, and their destruction is the result of this arrest of functional activity.

"The blood, when circulating through the *systemic* capillaries, yields a portion of its oxygen to the tissues it permeates, and receives from them carbonic acid. On the other hand, when passing through the *pulmonary* capillaries, it gives up its carbonic acid to the atmosphere, and imbibes a fresh supply of oxygen. Now, if either of these changes be prevented from taking place, a retardation, and even a complete stagnation of the

blood will take place, the flow through the capillaries being now resisted, instead of accelerated, by the relation which the blood bears to the tissues."

"The change in the condition of the blood, in regard to the relative proportions of its oxygen and carbonic acid, is the only one to which the pulmonary circulation is subservient; but in the systemic circulation, the changes are of a much more complex nature—every distinct organ attracting to itself the peculiar substances which it requires as the materials of its own nutrition." An acceleration when undue and abnormal, of this character, is known as "*active congestion*," or "*determination of blood*." In the softer tissues these pathological conditions can be arrested before inflammation or stagnation sets in; but in the denser or bony tissues, and especially those forming the teeth, the remedy cannot be applied; the interstitial deposit cannot be corrected or reduced to a normal standard, and a stagnation is the result, which finally produces disorganization and decay.

These changes in the capillary circulation may not indicate distress in any of the larger organs, or their functions. The system may be entirely free from any diseased condition of the vital forces. But as the individual, standing upon the shore of a river, may drink in miasmatic poison from the grateful breeze that fans his over-heated and sweated brow, so may those hard unyielding organs receive the seeds of decay and death in the very flow of life and spirits which bring the glow of health and beauty upon the cheek by the extending walls of the capillary maze, which allow the red corpuscles of the blood to come to the surface by reason of an acceleration of the circulation.

It is rarely, indeed, that the diseases of the teeth can be traced to such delightful surroundings, or such fine robust conditions. But is the fact not apparent, at every step of scientific research, that the elements of life and death are not only running side by side continually through our veins and arteries, but that every step in life, and every phase of enjoyment, are beset with dangers which sometimes suddenly lead to the grave.

Here "*dental hygiene*" is at fault. The dentist, however skillful and thoroughly scientific, must stand abashed before these freaks and mandates of nature, and ply his skill in operations upon the diseased organ, or allow the work of decay and death to run its course, and restore the function by an artificial denture. These results do not flow from the same causes, before enumerated, and consequently cannot be met by the same hygienic treatment; but they confront us at every step of our experience in active practice, and, therefore, demand our attention.

Perhaps the best and simplest definition of the idea of "*dental*

hygiene" may be found in the phraseology, "*raise the teeth*," as you would raise a child or a tender plant.

Observe all the rules known to what might be termed a *sanitary regime*, and you meet the demands of the economy, so far as external causes and agencies are concerned. This treatment goes very far toward a good development of the dental organs; but, as we maintain that the cause of decay is not at all times of this outward character, this kind of treatment *alone* is not sufficient. To raise a child well, the process of ablution is not all that is required. There are laws and principles, the observance of which is not only necessary to a healthy growth of the system, but to regulate the habits, the diet and appetite, and a good mental and moral development of the faculties are all necessary. Good substantial food, containing all the elements necessary to build up and nourish the various tissues of the body—clean, warm clothing to protect the surface from the chilling blasts of winter, and regular out-door exercise—all, with temperance and moderation, will not only raise the child well, but, in a large majority of cases, *raise a denture* well calculated to withstand the changes of life, and endure the wear and tear of mastication.

We cannot crowd all the out-croppings and freaks of nature into an easy subserviency to hygienic laws; but in the main, with the deeper intuitions of observant and well-balanced minds, every community can be so educated to general principles as to aid, through popular sentiment, an improvement in the general physiological status of the race.

All seem to comprehend the art and mystery of destroying the human fabric. They seem to know what steps to take to run this magnificent structure into decay and death, but are slow—very slow—to grasp the idea of health and happiness.

The simplest way to raise a child well, *is to desist from abusing it.* Break in at once and forever upon those habits and fashions which are leading children, almost from lisping infancy, into the maelstrom of extravagance and dissipation. Resist the overpowering pressure of the baser and more vulgar customs of modern life, and yield to the surer and better dictates of nature, (if there is no other help at hand,) and the work is done.

But, to raise a *regular, enduring denture*, is not always the work of unaided nature. A careful harmonizing of the conditions of growth with the principles of science and art, is the prerogative of our profession, and which should be exercised whenever there seems to be an inability in nature to perform its task.

In the finest and best developed forms the teeth often present themselves in most unsightly irregularities. In such cases the skill of the dentist must be brought into requisition, for, however strong in texture such

teeth may be, their crowded condition will render them liable to disease from external causes.

A few thoughts in regard to the liability of teeth to decay from neglect and abuse, and the influence of acids and alkalies as they come up, either in the secretions of the mouth, in food, or by direct contact, and we are done.

The low vital power of the enamel renders it susceptible to great and lasting injury, where any of the last named reagents come in direct contact with it. It contains so small a per centum of animal matter that those strong poisonous substances destroy the vital principle, and leave the mineral structure a dead, disorganized mass of matter, which breaks away in the process of mastication, or shows signs of disintegration in black, decayed spots, or a discoloration of the enamel altogether. These evidences of decay often present themselves where no such corrosive action can take place; but the whole theory of external injury must rest upon the hypothesis of some such decomposing agent, constituting, either directly or in an indirect manner, the disease of this hardest of all organized bodies.

That a powerful corrosive action can take place by the decomposing of animal matter, or vegetable substances, through the action of the saliva, when such substances are allowed to remain upon or between the teeth, no one will undertake to deny; and that many teeth are destroyed from such filthy neglect is also a fact beyond controversy. But in most cases, even when those elements are present, and where those more active and more deadly reagents, before mentioned, do come in contact, the influence they exert is very much over-estimated.

If the enamel is of a first-class development, and there are none of the internal causes above enumerated present, such neglect or abuse will be very slow in producing an entire destruction of the denture, or even the decay of an occasional tooth. Where is the practitioner of half a dozen years' experience who has not seen beautiful dentures, of that iron texture, without spot or blemish, save a slight abrasion of the crowns, where the possessor can boast of his ability to "*clip in two*" a ten-penny nail? And this, too, with the other boast of never having touched their teeth with a brush. The Irishman and the German often present such developments, but they are rarely seen in the more modern circles of American life.

We, as Americans, are, however, not without beautiful specimens of first-class teeth, which, too, can be, and in the majority of cases are, preserved through care without a spot of caries, until a late period of life, when, by a sloughing of the "*periosteum*," or an absorption of the integuments, they loosen, become painful, and must be removed.

Much, too, has been said and written about "*acids*" and "*alkalies*," as they come up in the food and condiments in use by modern epicures.

Those deductions and conclusions, we think, are strained and largely over-estimated. When mixed and baked, and boiled and cured, they come in contact with the teeth as entirely different chemical compounds, and their influence is no longer acid nor alkaline, but so mild in their effects, especially regarding the fact that they are held there so short a time, that very little injury can be caused by them.

Much of the distress, however, occasioned by all the above enumerated agents, can be prevented by a proper system of hygienic treatment. In order properly to meet all the contingencies necessary, and to comply with the suggestions of science, in the work of *raising* and *preserving* a good, enduring and substantial denture, the dental practitioner should have control of the process of dentition from infancy, and much of the manner of the child's living. The eruption of those organs should be an operation of special care, and when they are fairly developed, frequent inspection and good sanitary directions, with all the treatment, such as the nature of the case may require, and you meet, in a scientific way, all the mandates of what we understand by *dental hygiene.*

LANCASTER, PA.

MERCURY IN VULCANIZED RUBBER.

BY JAMES TRUMAN, D. D. S.

This subject has recently attracted more or less attention in the different associations and journals, but the remarks made have usually been founded more on supposition than upon any real practical knowledge of the chemical changes produced in vulcanizing. This work has not, that I am aware of, been attempted in a thorough manner, nor is it my purpose in this brief article to do more than give some general results of imperfect examinations made. It would seem, however, a work of supererogation to attempt to prove, that which no one should deny, that mercury exists in the coloring matter of the rubber. Sulphide of mercury, (vermilion,) it is well known, can be resolved into its original elements by heat. If it be placed between two glass slides for convenience of examination, and, by means of an alcohol lamp, a gentle heat applied, free mercury will be present in quantities sufficient for examination under a low power of the microscope. But it will require a high degree of heat before the entire amount is resolved.

This well-understood fact led to repeated examinations of various preparations of rubber vulcanized at different periods of time. I propose simply to give the result of these at present, without entering into a tabular statement. Rubber that had been kept in the vulcanizer for upward of four hours, at the usual temperature, exhibited free mercury in profusion, but minutely subdivided. That examined, kept at 320° for

one hour, exhibited minute globules in moderate quantity; while in another specimen, kept for forty minutes at 300°, none could be found. Fresh rubber, exposed to a gentle heat on a glass slide, yielded large globules of free mercury. Although these were large enough to determine the true character by sight, they were further tested by nitric acid. Examinations were made to test the character of the discoloration almost universally present in the piece when first removed from the vulcanizer. The result was, that it consisted of free mercury, from the most minute brilliant point to globules of large size. This also was tested with nitric acid, with the usual results. The action was very rapid, visible to the unassisted eye, by the immediate cleaning of the rubber. Throughout all the rubber examined, a large amount of salts were present. Much of this presented the peculiar appearance of some of the salts of mercury; but it will require a more exact investigation than has yet been given to determine their character.

I think the conclusion may be justified, from the results obtained, that free mercury is produced in quantities proportionate to the amount of heat and the length of time it is kept under the process. That other chemical changes may be produced by the presence of sulphuretted hydrogen, strong evidence exists; but, as yet, I have not had time to prove the supposition to be true.

Occasional globules of mercury of large size will frequently be found upon the surface of plates. The finding of them led Dr. Wildman to make some examinations, the results of which he gave at a meeting of the Pennsylvania Association of Dental Surgeons. I am not, however, prepared to believe that this is a usual exhibition. I have failed, in almost every instance, to verify this fact. This, however, is not surprising, as results in the many examinations made were by no means equal.

As this subject has been delegated to the proper committees of the Pennsylvania Dental Association for thorough examination, I am in hopes that much that is as yet speculation may be placed on a scientific foundation.

The assertion that the amount of free mercury in the rubber is proving deleterious to the health of thousands, will require, I think, a far larger amount of statistical information than we possess at present. The absolute truth, I imagine, will always be difficult to arrive at, owing to a want of knowledge on the part of the dentist of constitutional condition existing in the patient, that may have produced the effects charged to the credit of the rubber. Again, the knowledge requisite to make a critical examination is possessed by the few, and it is not surprising that the remarks often made exhibit conclusions founded on very slender premises. I have not met with any of the mischievous results said to follow the use of this

material; but, at the same time, am not disposed to deny that such have resulted. The statements have been too many and too well supported to take any such extreme position. With me it is yet an open question, requiring fuller and more exact knowledge, before either side can be adopted. So far it must, however, be admitted that peculiar idiosyncrasies of constitution exist, that will be affected seriously by the most minute quantity of any of the active poisons. Admitting this, the question may be properly considered, can the free mercury contained in the rubber pass from that to the oral secretions? It seems to me that this can alone be accomplished from the surface of the rubber plate.

I am not prepared to admit the porosity of rubber, as that is generally understood. In repeated examinations made to test this, by high powers of the microscope, nothing resembling pores has ever presented. It has been found impossible to procure a section thin enough to transmit light, although ground down to extreme tenuity. Examined as an opaque object, it presents a homogeneous mass, with no appearance of any openings for the admission of fluid; nor have I ever been able to discover moisture in specimens that have long been worn. That it is impenetrable to moisture in the ordinary process of wear, is apparent in the non-increase of weight. Time has not permitted to accurately test this, but common experience justifies the conclusion. That it may be penetrated by fluids, under pressure, cannot as yet be affirmed or denied, as the experiment has not yet been tried;* but I do not believe that in the ordinary process of wear in the mouth, fluids ever enter it. Cracks there may be, and these are readily seen, into which fluids pass, and become very offensive. A similar result is sure to follow by the secretions penetrating between the rubber and the teeth; but that it enters the substance of the rubber requires more proof than is now possessed.

Admitting this to be a fact, can we suppose that the minutely divided globules of mercury could pass from the centre, or from any point removed from the surface, to the oral cavity. My own judgment is, that such would be impossible. This view is partially sustained by the fact that the mercury in old worn plates presents the appearance of having remained in an entirely undisturbed condition from the commencement. If, as is supposed, the mercury is being constantly eliminated, there must be a constant chemical change going on to resolve the coloring matter into free globules. This, we presume, will hardly be admitted by any one.

It is, however, time that we had left the speculative on this question, that we may be able to give an intelligent answer to the oft-repeated

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* Since writing this, I have examined a very ingenious instrument for testing this, made by Dr. T. L. Buckingham. It is to be attached to the air-pump, and promises to answer the end desired.

inquiries of patients. If, as is asserted by some, thousands are being poisoned by the use of this material, certainly a due regard for their interests, and our own accountability, require a reason for the faith that guarantees such statements.

QUACKERY.

BY T. L. BUCKINGHAM, D. D. S.

Quackery is defined to be the boastful pretensions or mean practices of an ignoramus. But I intend to extend the meaning, and show that what we term quackery is not confined to the ignorant pretender alone, but we frequently find it practiced by those who do, or should know better; and it is by the practice of this better class of dentists that these quacks (or what the printers would call rats) get into the profession. In order to present the subject as I wish to, it will be necessary to call the reader's attention to the advancement and condition of the two branches of the profession, viz: the operative and the mechanical branches. We take it for granted that it is admitted by all, that the practice is divided into these two branches, and that nearly all the talent of the profession has been devoted to the operative branch.

We will not stop now to inquire the cause. The fact is so well known that scarcely any one will deny it; and I think it will be admitted with equal unanimity, that no mechanical operation has ever been described, discussed and explained as fully as the operation of filling teeth. For the last thirty years it has been the favorite subject at all the conventions, and in our books and journals it has occupied more space than any other subject. Every imaginable shape and form of instrument has been minutely described. The process of manufacturing, and the method of using them has been gone over so carefully that there can be scarcely anything new said about them. And then the cavities of decay, the methods of getting at them, the shape they should be made to retain a filling, the fissures, the grooves, the retaining points, have all claimed attention. The means of keeping the cavities dry, with napkins, wedges, ligatures, spunk, rubber dams, and other dams that do no good, have been as fully described. And, to undertake to explain the various processes of preparing the gold and packing it in the cavity, and finishing up the operation, would take a volume. If any one not acquainted with the art of dentistry should attempt to look over the published reports of our conventions and societies, he would think the talent of the whole profession had been concentrated upon the process of filling teeth. Now, what has been the result? The operation of filling teeth has been brought as near to perfection as a mechanical operation can be. The gold is made as solid as it would be had it been melted and poured into the cavity. Whole crowns

are built up on roots and used for masticating the hardest food, and in some cases the wearer shows almost as much gold as there is enamel left on the natural tooth.

While the operative branch has advanced so rapidly, and has been brought so near perfection, what has been done to improve the mechanical branch? I think it will be admitted that it has not only not advanced, but it has retrograded. Twenty years ago most of the dentists who inserted artificial teeth manufactured them. The furnace in the laboratory was an indispensable appliance, and few thought of having a full set of teeth made without having the teeth carved for the case. To be sure, then teeth did not always present as smooth and regular an appearance as those manufactured now, but in the mouth they usually had a much more natural appearance: and, had the attention been paid to manufacturing them that has been given to the operative branch, we might have had them much nearer perfection than artificial teeth are at present. The introduction of rubber as a base has retarded the advancement of this branch perhaps as much, or more, than anything else. Formerly, when teeth were mounted on gold or silver, it required considerable skill and practice to work these metals; and to select teeth, grind and arrange them on the plates, and then solder them and finish them up, even in the rough manner it was sometimes done, required much more skill than it now does to mount teeth on rubber.

Another cause which has held this branch in check, and which cannot be removed is, it does not require the patient to be present while the work is going on; and we are well satisfied that if the natural tooth could be removed from the mouth and taken to the laboratory to be filled, as the artificial ones are to be repaired, the operator would not twist himself up in a cork-screw shape and sweat for an hour or more to perform the operation, but would employ some assistant to do most of the rough work; but, the patient being present, the operator cannot shift it into other hands and still get the credit of doing it, as he can do with artificial work.

But the great cause that has held mechanical dentistry back, is to be attributed to the better class of dentists; those who devote their time mostly to the operative branch. If they would give up the mechanical work entirely, and let those who are willing to attend to it have the benefit of it, there might be some possibility of raising it; but this they will not do. They continue to take impressions, and do the work that requires the presence of the patients, and then let the balance be done by an assistant; and, in a majority of cases, this assistant is either a student just commencing, or some young dentist who does this work to keep from

starving, hoping at some future time to be able to get into regular practice himself, and this work assists him to prolong his professional existence until that time arrives.

If those who persist in inserting teeth would give their personal attention to the cases, and see that the impressions were correct, and the teeth made or selected to suit the case, we would soon have this branch advancing; but they merely take the impression, and, in a majority of cases, it is very badly taken; for it is a fact, that what people do not like to do they never do well. They then select something near the color they want the teeth to be, and this is all the mechanical workman has to go by in mounting the teeth. He has no more interest in it than to get the small pittance that is usually paid him for his work; for, it is true, that while operators are anxious to get all they can for their operations, and think they are never paid well enough, these very men, when they have to employ others, pay them the smallest pittance; at least such has been my experience, and I had a great deal of it some years ago. But the principal cause retarding the advancement of this branch is the low price that these good dentists charge for the work; while they will charge from five to twenty dollars for filling a simple cavity, they will insert a whole upper set for the same amount; and when a dentist who has some skill in this branch attempts to raise the prices so as to compensate himself for his labor, he is met every day with the reply from the patient: "Dr. ——, who you all acknowledge to be one of the best dentists in the city, will make me a set for about half you want to charge; I will go to him." It avails but little to say to them, the doctor whom you have just mentioned does not do his own work, nor does he employ the best workmen. He has the reputation of being a good dentist, and that satisfies the patients.

It is through the mechanical branch the quacks get into the profession. Very few young dentists, let them be ever so well qualified, can establish a practice in the operative department without waiting for a long time, while quacks, who stay a week or two with some one who professes to be a dentist, and will show them how to do a piece of rubber work, will open an office, advertise, and show specimens of their work, and in a little time get quite a run of customers.

We may enact as many laws as we can write out. If we leave this branch of our profession as it is, we will have quacks, and a great number of them. Elevate this branch, so that it will be as difficult to practice it as it is to practice the operative, and the quacks will disappear.

OS ARTIFICIAL AS A CAPPING.

BY FRANK B. DARBY, D. D. S.

I have noticed several articles in the DENTAL TIMES, during the past year, on this subject, some speaking of it highly, while others seem to consider its use destructive to the dental pulp. I think a great many in the profession are prejudiced against it, as I was at one time, and I am willing to acknowledge that my prejudice was without foundation, for I had never tried it. Still, I was so opposed to its use that for a long time I even refused to try it. At last the truth was forced upon me, and my prejudice gradually vanished. This occurred in the fall of 1866, when I had an occasion to remove a large amalgam filling, which one of my neighbors had introduced two years previous, and used this material as a capping. The lady informed me that she went to the dentist at the time this tooth was filled with the intention of having it removed, having suffered with it several days, but upon being assured it could be saved she allowed the operation to be performed. This filling, as I said before, had been in her mouth two years, when the tooth broke away, letting part of the filling escape. She then came to me to have it refilled. I found the tooth in a good healthy condition, and in excavating I cut through the capping before I was aware anything of the kind had been used, and was surprised to see blood issuing from the pulp. I then made inquiry and learned, as I stated above, the previous condition of the tooth. I then refilled it as it was before, using os artificial for the first time, but with a faint idea of success, I assure you. It proved successful, however, and after a time I found myself using it often: and, in fact, from that time I have used it almost daily in my practice with success, although I dared not advocate it, and above all things dared not write an article for publication until I had thoroughly tested its merits, knowing very well that my views were right the reverse of those held by many at that time.

I have spoken of os artificial, or oxychloride of zinc, as a capping; but, strictly speaking, I do not use it as such; I modify its use somewhat by first introducing asbestos.

My *modus operandi* is as follows: After preparing the cavity, I apply chloroform to the exposed point until the pain ceases; then introduce a particle of asbestos, slightly moistened in creasote, (this I consider one of the best non-conductors,) sufficiently large to cover the exposed point: then place upon this os artificial, moistened merely enough to hold together, and after packing allow it to harden before exposing it to the moisture of the mouth. When gold is to be used in filling I generally use enough of the paste to entirely fill the cavity, then dismiss the patients for a few days. Upon their return, remove about three-fourths or two-thirds, as the size of the cavity indicates, of the temporary filling, and fill

upon the remainder with gold, as usual. But when amalgam is to be used, I merely wait long enough to allow the os artificial to set, which is from one to two minutes.

It is very often the case that the patient will not return to have the permanent gold filling put in for three or four months, but in such cases I generally find the temporary filling in good condition and preserving the tooth; in fact, I think I would always prefer leaving the temporary filling in at least three months if I were sure it would preserve the tooth in all cases. My experience with this mode of treating exposed nerves, now for over two years, has been more successful than I imagined at first it could be, and I have no hesitancy in stating that, out of every ten healthy teeth filled in this manner, for comparatively healthy persons, nine of them have proved successful, and the operation attended with but little or no pain, or at least no more than would follow an application to destroy the nerve.

My faith has become so strong that I now cap in this way in almost every instance, rarely ever making use of nerve paste. I have several patients in the village whom I have treated teeth for in this manner, and have an opportunity to see them often, therefore *I know* some of my operations have been successful.

I might mention, too, that I consider os artificial one of the best remedies for sensitive dentine. I saturate cotton in a thin mixture of it, and place it in the tooth, and let it remain two or three days; the cotton becomes hard, and serves as a temporary filling.

I do not advance this mode of treatment in capping exposed nerves, with the addition of asbestos, as original with myself; many are undoubtedly using the same. I give the result of my experience to the profession for what it is worth, and think if it is given a fair trial, putting aside all prejudice, it will prove quite as successful with others as with myself.

Owego, N. Y.

LOST PARTS RESTORED BY AN ARTIFICIAL APPLIANCE.

BY B. A. RODRIGUES, M. D.

The daily exercises of a responsible professional business have furnished me numerous opportunities for communicating pathological facts, and surgical performances of interest to dental science; and, sometimes I think my delinquencies, in this connection, almost reprehensible; for since the record of a case of "*exostosis of the antrum*," which I published in the Philadelphia *Medical Journal*, some years since, copied subsequently in Harris' Dental Surgery, I have scarcely contributed anything to dental literature.

I desire, at present, to invite attention to the case of a gentleman, aged 30 years: who, after protracted, ulcerative and absorptive inflammation of the palate had terminated, came under my care; the disease having compromitted in its ravages both horizontal plates of the palate bones, and the palatine processes of the superior maxillary, leaving an osseous ridge of inconsiderable size, circumscribing concentrically the alveolar border of the upper jaw.

It is needless to remark that *deglutition* and vocalization were almost completely destroyed, so that while fluids and solids regurgitated, the voice resounded through the upper part of the head and nostrils, and even inspiration was impaired when the mouth was closed, by collapse of the *alæ nasi*.

The state of our patient plunged him into hopeless despondency, and excluded him from all social intercourse.

A range of very fine teeth induced me to seek a basis of support for some mechanical adjustment, other than the usual clasps around the teeth, and availing myself of the semicircular bony ridge, the only vestige of the former osseous palate, I contrived a vulcanite plate, with a crescentic *sulcus* or *groove*, which we so carefully adjusted and finished, as to secure successfully a *basal* support for the entire piece. So completely has the chasm been filled by my "*operculate plate*," as I have termed it, that all deficiencies and defects have been signally removed.

Shut out of society by the loss of voice, his dejection of spirits was at once relieved, as he stated to me with undisguised gratitude; that while in company with some ladies, they exclaimed with surprise that his voice was restored.

These particulars I have entered upon, presuming, that you may deem them of sufficient importance, to publish in your journal.

CHARLESTON, S. C.

A STATISTICAL NOTICE OF THE CLINICS IN THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

BY E. WILDMAN, M. D., D. D. S.

In presenting to the readers of the DENTAL TIMES a tabular history of the operations performed in the clinics of this institution, from its organization to the present date, it would appear almost needless to add a word to call the attention of any one to the valuable information they convey to the dental student. But, as there are still many dentists who adhere to the idea that a student can become as fully accomplished in all the requirements necessary to fit him for the profession, under the instruction of a

private preceptor, as in a dental college, we solicit such, and dental students, to give these tables a careful perusal.

They show that the average, for each session, has been over 21 patients for every matriculant; that the average for operations has been 23 fillings inserted, 42 extractions, and total operations performed, by each, 70.

To obtain a more correct view of the present working of the college, we will give the average for the last three years. In making this estimate, 29 matriculants who graduated on time, under the provisions of the second article, on "qualifications for candidates," are not taken into the calculation, as they performed but few operations in the clinics.

During this period the average, each session, has been, for every student, 34 patients, 31 fillings inserted, 41 extractions; total operations, 83. And in the laboratory the average has been 26 teeth mounted and inserted for patients, by each student, per session; and including those mounted on depositing cases, by candidates for graduation, make it 31.

Under the heading of "other operations," and summed up under "total number of operations," is included diseased antrum, alveolar abscess, periostitis, inflammation of the gums, and various other diseases to which the buccal cavity is incident, and which comes under the province of the dental surgeon to treat.

Among the class of patients who present themselves at the clinics of a dental college, are found diseases which rarely occur in private practice.

The advantage to the dental student in the clinic is not confined alone to the large number of patients assigned especially to each one, but he has the privilege of witnessing all the operations therein performed, now averaging, per session, from 5,612 to 7,532, all of which are performed under the watchful guidance and supervision of able and skillful demonstrators.

Now, this presents a mass of work and advantages which no private preceptor could offer to his pupil, however extensive his practice might be. This great amount of work performed by the student is only a part of the advantages secured to him; it is but the practical application of the teachings of the various chairs in the college.

I think, after a careful investigation of the above data, the most prejudiced will admit that a student, who has had the required preliminary education under a private preceptor, and then enjoys the privileges of a course of instruction in a dental college, will have a better ground-work to enable him to take a high position in the dental profession, than one who may confine himself alone to private instruction, no matter what skill and attainments his preceptor may possess.

OPERATIVE DEPARTMENT.

Session.	No. of Patients operated for.	Gold Fillings Inserted	Tin.	Amalgam.	Wood's Metal.	Hill's stopping	Ox. Chl. Zinc.	Sub. not given.	Total Fill'g	Extraction of Roots & Teeth.	Irregularities.	Pivot Teeth set.	Other Operations.	Total number of Operations.
1856–'7	*296	367	228	3					598	862		10	115	1,685
1857–'8	368	545	287	2					834	2,223	2	9	84	3,152
1858–'9	394	568	335	5					908	3,074	16	18	156	4,172
1859–'60	308	612	310	6					928	2,858	20	25	224	4,055
1860–'1	567	720	360	2				14	1,096	3,129	41	8	327	4,601
1861–'2	620	454	325	7				11	797	2,464	51	13	272	3,597
1862–'3	772	559	526	3				12	1,100	2,067	10	5	204	3,386
1863–'4	1,687	607	690	6				13	1,316	2,112	15		385	3,828
1864–'5	1,487	627	696	12	9	14			1,358	2,010	10	2	297	3,677
1865–'6	1,692	671	562	18	25	28			1,304	2,107	20	2	326	3,759
1866–'7	2,517	1,216	1,026	26	12	96			2,376	2,451	61	17	984	5,889
1867–'8	2,759	1,393	1,091	20	28	105			2,637	3,986	57	15	837	7,532
1868–'9	2,663	1,124	701	85	4	108	62		2,084	2,990			538	5,612
	16,130	9,463	7,137	195	78	351	62	50	17,336	32,333	303	124	4,749	54,845

* No record kept of patients for whom extraction alone was performed prior to 1863–'4.

Session.	MECHANICAL DEPARTMENT. No. of patients	Teeth Mounted for patients.	Obturators.	Teeth on Depositing Cases.	Total Nos. of Teeth Mounted	MATRICULANTS AND GRADUATES. Matriculants	Degrees conferred on Students.	Honorary Degree.	On Time and Examination.	Total Degrees.
1856–'7	†	474		‡	‡	33	13		§	13
1857–'8		679				48	15	1		16
1858–'9		1,141	4			48	25			25
1859–'60		1,579				51	21			21
1860–'1		2,037				63	36			36
1861–'2		1,210				44	19			19
1862–'3	95	1,213	1			41	20	2		22
1863–'4	125	1,647	3			44	17			17
1864–'5	154	2,009	2			56	29	5		34
1865–'6	154	2,735	1			69	33		3	36
1866–'7	167	2,660	2	431	3,091	100	26		23	49
1867–'8	157	2,040		438	2,478	78	31		2	33
1868–'9	95	1,278	2	364	1,642	80	24		4	28
	947	20,702	15			755	309	8	32	349

† No record kept prior to Session 1862–'3. ‡ No record of Number kept until Session 1866–'7. § Having complied with 2d Article on "Qualifications for Graduates."

DENTAL PLEDGES.

BY C. A. MARVIN, D. D. S.

Perhaps there is no one feature which more strikingly distinguishes a profession from a trade than this matter of pledges.

The architect pledges himself to furnish a symmetrical and convenient plan of your house. The builder pledges a faithful execution of that plan, and consents to suffer a loss if his pledge is not redeemed. All mechanics pledge beforehand that the articles they are to furnish shall be perfect and satisfactory; that the work they are to do shall equal the best, and endure with the most durable.

This is a characteristic of tradesmen and manufacturers. Not so with professions. A professional man does not make pledges as to results. He cannot do it. He ought not to do it. It is not in harmony with his calling.

What physician can pledge a cure in a certain number of days? or can pledge a cure at all? What lawyer can pledge a successful issue to a cause just commenced? It smacks of the charlatan to attempt it.

Neither should a dentist give pledges. I mean, of course, special pledges of specific results.

No dentist, when he has filled a tooth, can say with certainty how long that tooth will last. A thousand contingencies may arise, unsuspected by him, any one of which will affect, to a greater or less extent, the permanence of the organ.

As a physician, when he has cured his patient, cannot tell how soon he may have a return of the same disease, so cannot a dentist say positively, when he has treated and cured a diseased tooth, or bone, or gum, how long a time may elapse before his services may again be required to relieve pain in the same part.

It is not a favorable sign when a dentist is heard promising his patient that such and such operations will last so many years; that there never will be any more pain in a certain part, &c. The inference from such promises is, that the dentist does not appreciate his profession, or is not a true man. If he rightly understands the intricacy of the work daily committed to his hands, he will make no such random promises. Think of it a moment.

A dentist is dealing constantly with parts of the living organism. Each tooth he touches is as truly and delicately connected with the whole structure as is the eye. There is vitality within it and around it. There is nerve life, blood life and flesh life within and about every tooth. Neither has a tooth an independent existence; it is intimately connected with parts contiguous and parts remote. A diseased tooth makes "the whole head sick and the whole heart faint." The diseases to which the

dental organs are subject, and to the production of which their defective condition tends, cannot be enumerated; their name is legion.

Is it a slight matter, then, to take the charge of teeth, and be responsible for their healthy development and condition? Oh, no, it is no slight matter. A grave responsibility rests upon the man who announces himself as a dentist. And every year that rolls over our heads is educating the public to hold dentists to their responsibility more and more.

When the opinion of a dentist is asked to-day he is expected to give it with more readiness, and to give a more intelligent opinion, than was looked for a half score of years ago.

An intelligent opinion on any subject can only be given when that subject is thoroughly understood; hence the necessity of study, of knowledge. And by just the degree of knowledge a dentist has, by just so much will he appreciate the true nature of the work before him, and in proportion as he appreciates this will he be cautious in pronouncing opinions, earnest in giving advice, faithful in rendering service, and firm in refusing pledges.

But some one will say: "What am I to do when I am asked if I warrant my work? If I say I do not, I am immediately told that Dr. Smooth Tongue and many others do, and that if I cannot do the same, I must lose the case."

I answer, the matter is very simple. It can all be arranged to the satisfaction of both patient and dentist. The answer to a demand for a pledge should be this: "The pledge I give you is, that you shall have my faithful service." More than this no one can give, let him make all the pledges he will. Less than this, no dentist should ever render to his patient. And when a dentist has expended his best efforts upon any case, he has done his duty, no matter what the result may be. It is all that can be asked of him. If his skill be not sufficient to produce a favorable result, no previous promise of such a result would be of any avail. The only effect of such a result would be to place himself in an unfavorable attitude before his patient, and cause all his labor to be unappreciated. If, on the other hand, his skill is equal to the wants of the case, no pledge is necessary to induce him to apply it.

Success is not always attained. It is claiming too much to say I have never lost a case. Every dentist loses cases; that is, every dentist meets cases where the same degree of success cannot be attained; where he cannot achieve what he would; where he has grave doubts as to any lengthened usefulness of the organ upon which he has been working. How extremely unwise, then, to make promises or predictions as to the precise result he will effect.

Let it be distinctly understood, that I appreciate the difference between

an opinion and a promise; although so different, many people take them as synonymous.

Opinions are proper if wisely given; for, in many cases, they aid in coming to a determination. A dentist is supposed to be able to form an opinion of cases as they come under his observation, and it is a matter of daily occurrence that the decision of parents, as respects operations upon their children's teeth, or upon their own, is dependent upon the expressed opinion of their dentist. But such an opinion should be given guardedly, and on grounds which, if explained, would commend themselves to the understanding of the intelligent patient.

Advice should be positive; opinions cautious and well governed; pledges refused.

The reputation of a dentist furnishes the best and only sure pledge that can be given; on this the public must rely. If he be known as skillful and faithful, no other guarantee is required, and none other should be offered. Dignity of character and self-respect demand this.

As a physician is employed in order to profit by the skill he possesses, and the case is entrusted to his hands that he may exercise that skill upon it, so must it be with the dentist. Cases are committed to him for treatment, and he handles them as wisely as he may, producing the best results in his power. This is all he can do. This is all he should agree to do. The question will settle down at last upon this basis. Let every dentist, then, take the position at once, thus dignifying his profession, commanding respect, and dealing honestly with himself and the public.

Brooklyn, N. Y.

IMPORTANCE OF CLEANSING THE TEETH EVERY DAY.

BY J. S. SMITH, D. D. S.

The importance of keeping the teeth in a cleanly condition cannot be brought before the minds of our patients too frequently, especially the young. As practitioners of a liberal profession, and as moulders of the public mind in regard to a scientific calling, we should begin at home, and bring every facility into requisition to promote a deep and abiding interest in the minds of those entrusted to our care, in regard to keeping the teeth (and dental apparatus generally) in a cleanly and healthy condition. By laying down hygienic rules before them, they are led to view this important matter in its true light, and will thank us for the interest we manifest in their welfare. We shall never lose by imparting what we know, if it be but little, if that little be only truth. It may not be a direct gain in form of dollars and cents, but indirectly it will pay us for our trouble. The entire profession at large will be benefited by diffusing

intelligence among the masses concerning the paramount importance of patronizing the dentist.

I have had persons to call upon me to relieve pain, caused by the accumulation of calcareous deposits upon their inferior teeth, while, at the same time, they were wearing an entire upper denture. The amount and density of the tartar convinced me the work was inserted after the accumulation had progressed to a considerable extent. A gentle hint to the wise should be sufficient.

When patients place themselves under the care of the dentist, for the insertion of substitutes, where there are natural teeth in the mouth, we should not only keep these in view, but endeavor to instruct them in regard to preserving those that may have escaped the ravages of disease.

Calcareous substance has no injurious influence upon the enamel of the teeth, (I believe all observers and writers agree upon this point,) but is very injurious to the parts in connection with them, upon which they depend for support. If permitted to collect upon the teeth, so as to encroach upon the gums and alveoli, it will hasten the absorption of this tissue; and, if not removed in time, those teeth will eventually loosen and cause much irritation to the surrounding parts, if they do not drop out. Surgical aid must be resorted to for the completion of the work disease commenced. However, there are exceptions. In some constitutions, this progress goes on with but little annoyance to the patient; while in others, inflammation and suppuration of the adjacent parts will follow, breaking up the attachment of the teeth, and eventually causing them to fall out for want of sufficient support.

As for the varieties of tastes, and the elements of which do not come strictly under the head of this paper for discussion, I will aim principally at exciting a deeper interest in keeping those organs that were given to form part of the anatomical structure of man for a wise and beneficent purpose in a normal state, so far as cleanliness is concerned.

Not more than one-third of all the patients visiting the dentist are aware of the risk run from deposits of tartar, to say nothing of other foreign substances, that are allowed to collect around the teeth. Frequently they will come complaining that they have been attacked with scurvy upon the gums. On examining the case, we find no scurvy, but a huge lump of salivary calculus closely hugging part of the body of the crown, and running down in some cases nearly to the apex of the fang.

The disease first mentioned rarely attacks persons residing in rural towns and districts, or even large cities. It is more prevalent among those who are confined to shipboard; those who subsist upon one kind of food, and use stagnant water, and are compelled to live exposed to a moist, cold, foul atmosphere. That all persons are not equally affected

with calculus upon their teeth is a fact long known. The lymphatic temperament is said to be the most subject to the deposition of tartar. In my observation, I have always found it to exist in mouths of patients where the saliva flows in great quantities. The saliva has an alkaline character, thus holding in solution the phosphate of lime; and if the mucus be in an acid state, the action of the acid mucus upon the saliva will cause the phosphate to be precipitated. When we have this state, the acid mucus should be neutralized by an alkali. Scrupulous care should be taken in removing all depositions that may be connected with the teeth. The application of the brush and burnisher should follow this, and should never be neglected. The surface must be made smooth, otherwise the sharp particles remaining after the use of the excavators would afford lodgment to another coating in a short time. To prevent as much as possible a second attack, the saliva and blood should be kept in a normal state by using the proper remedies, and avoiding an excess of such kinds of food that tend to promote this deposition.

The patient should be instructed to clean the teeth daily with a well-selected tooth brush. A soft tooth brush is said to be the safest, as it is not so liable to wound the gums. A finely pulverized tooth powder should be used in connection with the brush. Care should be taken in recommending powders. None should be used, or prescribed to be used, the ingredients of which are not soluble in water, such as gum myrrh, charcoal, pumice stone, tobacco ashes, &c. Gum myrrh will deposit gum upon the teeth, while charcoal and pumice will settle under the margins of the gums, irritating and promoting absorption. The following formula makes a very safe and reliable tooth powder, called Barker's formula:

℞.—Os sepia, lb. v.;
Precip. chalk, lb. v.;
Pulv. orris root, lb. iiss.,
Sugar, white, q. v. lb. j.;
Carmine, No. 4. ℥j.;
Oil rose, gtts. x.—*Mix.*

The brush loaded with powder should not only be rubbed around the labial and buccal parts of the teeth, (which is too frequently the case,) but should be carried over the crowns and lingual and palatal surface. After all this careful brushing, the interstices between them are very imperfectly cleaned, if cleansed at all. It is seldom the brushes will pass between the teeth, and this is the very place they need it most. I know of no other method than to employ the quill and floss silk, or common packing thread. These are good appliances for cleansing. A good tooth wash should be placed in the hands of all to be used in connection with the dentifrice. Thus, by inculcating cleanly habits with all who may come

under our care for treatment, we will not have the mortification of seeing fillings, that have been placed in the teeth with skill, coming under care again, covered with mucus, gums in a turgid condition, the interstices between the teeth filled with remnants of food in all stages of decay. It is in keeping the teeth clean, as it is with all other important duties devolving upon us, some individuals need more prompting and definite instruction than others. Some have a natural pride in keeping their teeth clean, others have not.

I think if every dentist would instruct all who need instructions in this important duty of cleansing the teeth, showing them that it is not only injurious to their health and preservation, but for the health generally, in due time communities would become revolutionized in this important matter, and not only they but the profession of dentistry would be benefited by it. Remember, an "ounce of prevention is worth a pound of cure."

COLUMBIA, PA.

Dental Associations.

PENNSYLVANIA STATE DENTAL SOCIETY.

[Reported by Dr. R. Huey, D. D. S.]

Pursuant to adjournment, the State Dental Society met in the Hall of Representatives, Harrisburg, at 10, A. M., on Tuesday, June 8th, Dr. Samuel Welchens, 2d Vice-President, in the chair.

Dr. H. Gerhart, in the absence of the Chairman of the Board of Censors, examined and reported favorably on the credentials of the following delegates:

Harris Dental Association.

Drs. John McCalla, Samuel Welchens, Wm. N. Amer, M. H. Webb, John G. Moore, Lancaster; Dr. P. W. Hiestand, Millersville; Dr. J. Z. Hoffer, Columbia.

Lebanon Valley Dental Association.

Dr. W. H. Scholl, Bernville; Dr. W. K. Brenizer, Reading; Dr. W. K. Lineaweaver, Pottsville.

Cumberland Valley Dental Association.

Dr. Geo. W. Neidich, Carlisle; Dr. Geo. F. Platt, Chambersburg; Dr. James Fleming, Harrisburg.

Lake Erie Dental Association.

Dr. A. B. Robbins, Meadville; Dr. J. G. Templeton, New Castle; Dr. Geo. B. McDonald, Conneautsville.

Susquehanna Dental Association.

Dr. H. Gerhart, Lewisburg; Dr. H. H. Martin, Jersey Shore.

Pennsylvania Association of Dental Surgeons.

Drs. John H. Githens, Amos Wert, Philadelphia.

Pennsylvania College of Dental Surgery.

Dr. T. L. Buckingham, Philadelphia.

Odontographic Society of Pennsylvania.

Dr. J. W. Moffitt, Harrisburg.

Dr. R. Huey, Pennsylvania Association of Dental Surgeons, and Drs. Eisenbrey and , of the Odontographic Society, were tendered complimentary seats. The societies which they represented not having fulfilled the requirements of the constitution, they could not be admitted as delegates.

Adjourned, to meet at 2, P. M.

AFTERNOON SESSION.

The meeting was called to order by the President, Dr. A. B. Robbins.

Reports of committees being in order, the Executive Committee reported that they obtained the Hall of Representatives for this meeting, that they succeeded in securing an act of incorporation for this body, but failed in the "Law to regulate the practice of dentistry."

The Charter was then formally accepted by the Society.

The Committee on Publication reported the printing of two hundred and fifty (250) copies of the Constitution, &c.

The Treasurer's report was referred to the Executive Committee.

The Annual Address of the President was listened to with marked attention. It contained some sound advice relative to the workings and interests of the Society, which was afterwards acted upon.

The Secretary read a letter from Dr. Ambler, a delegate from the New York State Dental Society, expressing the interest felt in this Society, by the body he was chosen to represent, and regretting his inability to be present.

Dr. Samuel Welchens read an Essay on Dental Hygiene, which was referred to the Committee on Publication.

The Society then proceeded to elect officers for the ensuing year, with the following result:

President.—Prof. T. L. Buckingham.

1st Vice-President.—Dr. Geo. B. McDonald.

2d Vice-President.—Dr. James Fleming.

Recording Secretary.—Dr. Geo. W. Neidich.

Assistant Recording Secretary.—Dr. Wm. N. Amer.

Corresponding Secretary.—Dr. Samuel Welchens.

Treasurer.—Dr. John McCalla.

Censors.—Drs. Robbins, Brenizer, Martin, Gerhart and Amer.

Publication Committee.—Drs. Neidich, Welchens, McCalla, Prof. Truman, Drs. Stellwagen, Moffitt and Suesserott.

Executive Committee.—Drs. Templeton, McDonald, Robbins, Prof. Truman, Dr. Moore.

Delegates to American Dental Association.—Drs. McDonald, Martin, Moffitt, Scholl, Welchens, Fleming, Robbins and Gerhart.

Delegate to Ohio State Dental Society.—Dr. Templeton.

Delegate to New York State Dental Society.—Dr. A. B. Robbins.

The Physicians and Dentists of Harrisburg, were, by resolution, invited to be present, and participate in the meetings.

Prof. Buckingham was invited to deliver a public address at our next meeting, to be held at Pittsburg.

Adjourned, to meet at 9, A. M., to-morrow.

WEDNESDAY, JUNE 9TH.

The Society was called to order at 9 o'clock, and took up the "Bill to regulate the practice of dentistry." A thorough and earnest discussion ensued, in which a strong feeling was manifested to make another effort to have the bill passed. It was committed to Drs. Robbins, Buckingham, McCalla, Martin and Fleming, who were directed to make whatever changes they deemed necessary, and present it to the Legislature.

On motion, the Society recognized and adopted the essential features of the Code of Ethics of the American Dental Association.

The specific and physiological effects of vulcanized rubber were discussed with much interest.

Dr. Welchens had several cases presenting abnormal conditions, but he could not believe that the deleterious effects arose from the use of the rubber plate.

Dr. Buckingham had observed in many specimens of rubber, under the microscope, a metal which he believed to be mercury.

Dr. Moffitt mentioned a case where, in wearing a rubber plate, the mouth became very much inflamed and ulcerated on the surface. He advised a discontinuance of the use of the plate, which was attended with entire success. The patient and himself not being satisfied, the piece was again inserted with the same result. Afterwards a platina plate was inserted and worn with entire satisfaction.

Dr. C. B. McDonald had observed that food was much more liable to remain on the surface of a rubber plate than on one of metal. Where persons are uncleanly in their habits, this irritation is much more liable to occur.

Dr. Moore entertained the opinion that the irritation of the mucous membrane was caused by the foreign particles adhering to it.

Dr. Hoffer being a Homœopathist in belief, regarded the infinitesimal amount of mercury present would certainly have a constitutional effect.

Dr. Amos Wert had a case where the membrane was very much inflamed, but he attributed it to the plate not being vulcanized as hard as it should have been. He had never seen any irritation when the mucous membrane was naturally hard and healthy. He had noticed the same effects from silver plates.

Dr. Buckingham explained, that when the effect was merely a local one he did not place much importance to it. He referred more particularly to constitutional effects, with unmistakable symptoms of ptyalism.

Dr. McDonald considered the non-conducting properties of rubber as a strong argument against its use.

Dr. Robbins had found in several cases unmistakable evidences of mercurial action in the mouth and fauces—a discontinuance of the use of the plate restoring the normal action.

Dr. Robbins presented casts of an interesting case of irregularity, in which the teeth were placed in their proper position in the arch, the contour of the face greatly improved, and an impediment in the speech entirely removed, and explained his process.

Drs. McCalla and Templeton conducted to the chair the President elect, who, in a brief speech, thanked the society for the honor conferred upon him.

On motion, a vote of thanks was extended to the retiring President for the admirable manner in which he had conducted the proceedings of the Society.

Drs. McDonald, Templeton, McCalla and Suesserott were appointed essayists for the next meeting, and requested to inform the Corresponding Secretary of their subjects, that the members might be notified, in order to make preparations to participate in the discussions which, it is hoped, will follow each essay.

Dr. Robbins offered the following:

Amend Article XI, by striking out all after the words "vote of," and insert the words "the members present."

Dr. Geo. W. Neidrich read an essay on "The Histology of the Dental Tissues," which was received with applause, and referred to the Committee on Publication.

Dr. Robbins offered the following amendment to the Constitution:

ARTICLE XII.—CERTIFICATE OF MEMBERSHIP. Any member of the State Dental Society may, upon passing a satisfactory examination by the Censors, receive a certificate of membership, under seal, signed by the Censors, President and Secretary.

Dr. Buckingham was appointed to procure a suitable seal for the Society.

Adjourned, to meet at Pittsburg on the third Tuesday of June, 1870, the session to continue three (3) days.

BUCKS COUNTY DENTAL ASSOCIATION.

REPORTED BY G. W. ADAMS, D. D. S.

A number of dentists of Bucks County and vicinity, met at the office of Dr. J. S. Rhoads, in Doylestown, on the 7th of June, 1869, and, after a free interchange of views and sentiments, it was decided to form a *Dental Society*, under the name of "*The Bucks County Dental Association.*" The officers thereof, for the ensuing year are—President, Dr. H. P. Yerkes; Secretary, G. W. Adams; Treasurer, J. W. Scarborough; Executive Committee, J. S. Rhoads, F. Swartzlander and J. Hayhurst.

This Association meets semi-annually, on the first Monday in May and November—next meeting to be held at the Temperance Hotel in Newtown, Pa. Subject for discussion—"*Taking Impressions.*"

Editorial.

ASSISTANT SURGEON WOODWARD'S LECTURE.

We recently had the pleasure of listening to this gentleman at the Hall of the College of Physicians and Surgeons.

We call it a lecture, but it partook more of the character of an exhibition of what the Government has succeeded in doing, through its aids, in the medical department at Washington. Dr. Woodward has earned well-deserved laurels, the world over, for his efforts. This success was abundantly proved during the course of the lecture, and the results obtained were very satisfactory in photographing, by the aid of high powers of the microscope. The minute anatomy of the various tissues were exhibited with a definiteness of outline and fullness of detail that called forth frequent bursts of applause from his audience.

We were particularly struck with his rendering of Nobert's lines. The nineteenth band of this plate was resolved into clear and well defined lines upon the screen. This feat was accomplished by the use of the sixteenth immersion lens.

Whether this process of illustrating tissues can be made available for

ordinary lecturing purposes, the future will prove. We think the Government owe it to the people that the medical schools should be furnished with duplicates of these photographs at a reasonable rate. At present, we understand, no copies are allowed to be taken. This is a narrow contracted policy, unworthy of a liberal government, and injurious to the educational interests of the country at large.

It is to be regretted that Dr. Woodward felt called upon to attack Dr. Beale's theory of the growth of tissues, in the manner he did. It would have been exceedingly gratifying to have heard his views at length on this subject. It seemed to us that this much was at least due to the reputation of one of the most conscientious and laborious workers in the ranks of science.

Upon the whole, we think this interesting exhibit of some of the results of Governmental aid, abundantly proves the importance of its assistance in matters of this kind. We have every reason to hope for a rapid advancement in microscopical research, by the free and generous use of the almost inexhaustible means at command.

Dr. W. deserves the thanks of the scientific public of Philadelphia for the lecture delivered; as also the Biological and Microscopical section of the Academy of Natural Sciences, through whose influence he was induced to deliver it.

SAMUEL S. WHITE'S PREPARATIONS FOR THE MOUTH.

We had the pleasure, recently, of inspecting the preparations put up by this gentleman, such as tooth powders, mouth washes, cologne, &c., and think we perform a duty to our readers in calling attention to them.

It must be apparent to every observant person that the manufacture of powders, soaps, washes, &c., by irresponsible individuals, has assumed proportions that render some notice of it imperative on the part of those who have the welfare of their fellow-men at heart. In the majority of cases these preparations may be free from injurious substances; but, as their composition is kept a profound secret, nothing can be, nothing ought to be done, but to condemn the whole.

So unblushing has this species of quackery become, that we sadly need a law, if none exists, to put a stop to the wholesale destruction of teeth by the peddlers of these nostrums at the corners of our streets. We all know that the public "cleaning of the teeth" of those unfortunate children who submit to it, means their total destruction. Another class, but one remove from these, claiming the honored title of D. D. S., parade their wares in the daily papers, city cars, &c., utterly regardless of their own or their profession's reputation.

We are, therefore, gratified that a responsible person has entered largely

into the manufacture of preparations, the formulas of which are *not secret.* From a careful inspection of these, we have no hesitation in asserting that they contain nothing in the least injurious to the teeth, or parts adjacent, if used under proper limitations, as all such preparations should be. They are not only valuable for the objects intended, but elegant in character, reflecting credit upon the taste of the manufacturer.

The extensive scale upon which they are prepared enables the proprietor to place them at a price as low, if not lower, than they can be made by individuals. We therefore hope that in future there will be no necessity to recommend patients to try the sozodonts or other irresponsible stuffs so much in general use.

THE STATE DENTAL SOCIETY.

The annual meeting of the above organization took place at Harrisburg on the 8th of June.

The meeting, though not as large as it should have been, was well attended, and full of interest to those present. We present our readers with a full report of the proceedings.

It will be seen that, owing to the neglect of some of the societies to forward their constitutions, some difficulty was experienced in admitting their delegations. This want of regularity is, perhaps, inseparable from all new organizations, and is one easily remedied in the future.

We regret that the Convention did not spend their time in completing a law to be presented to the next legislature. The reference to a committee, we fear, will result in nothing, as committees of large bodies, widely separated, are proverbially slow to act.

The election of our colleague, Dr. T. L. Buckingham, to the presidential chair for the ensuing year, is an honor, we think, eminently earned by long and faithful service in the profession.

THE NEW YORK COLLEGE OF DENTISTRY.

We learn that this institution has ceased to exist, or, at least, is in such a condition that its resurrection is hardly among the possibilities. The causes of this sudden break up have not yet been fully made public, nor is it essential they should be. We regret this failure, as it will have an injurious effect upon any future efforts to enlist the sympathy and co-operation of the profession in Dental Schools. Perhaps no other institution of a similar character has had more of that fostering care, or a greater amount of local interest than this, and it is to the credit of New York dentists that such was the fact.

We have long been of the opinion that the increase in the number of

Dental Schools is far in advance of the wants of the profession. The forcing process which has been adopted, under the mistaken idea that the more schools the more students, must end disastrously to some and injury to all. The increase in the number of these must be in exact ratio to the increase of intelligence and cultivated appreciation of the needs of professional life. That this is a slow process all must admit. Colleges as educators are valuable in proportion to their ability to impart instruction, and this ability is greatly dependent upon the material aid they receive in the shape of dollars and cents. Talent is an excellent thing: indeed, it is indispensable to success here and elsewhere; but when ability finds itself unsupported by pecuniary reward, the supposed honor of position fails to furnish stimulus to exertion, and failure results. Instead, therefore, of being educators in the enlarged sense, the proportions are gradually dwarfed, until they become a by-word of reproach, to be held up as examples of the failure of Dental Schools. Better, then, in our judgment, aid in making those institutions more powerful for good, that have shown their ability to advance amidst many discouragements. Insure their stability, and the graduates will feel that the diploma received is worthy the labor expended to procure—a feeling that can never attach to anything so ephemeral as many must be.

BOSTON DENTAL COLLEGE.

We append the following report of the proceedings of the Supreme Judicial Court in this case:—

SUPREME JUDICIAL COURT—SUFFOLK, SS.—JUNE 19. COLT, J.

The Attorney-General, by Relation, vs. The Boston Dental College, et al.

This was an information, at the relation of John P. Ordway and others, constituting a minority of the Board of Trustees of the Boston Dental College, to restrain the respondents, the majority of the board, from conferring the degree of "Doctor of Dental Surgery" upon certain candidates who have been recommended for such degree by the faculty of the college. By the act of incorporation, passed June 3, 1868, the trustees of the college have authority to confer the degree of "Doctor of Dental Surgery" upon candidates therefor, who, upon satisfactory examination by the faculty, have been recommended to the trustees for the degree, provided the candidates shall have devoted three years to the study of dentistry with a practitioner of dental surgery, who shall be approved by the faculty, or shall have been in the practice of dental surgery for eight years, *including two full courses of lectures*, the last of which to be pursued in the Boston Dental College.

At the hearing on Saturday, on a motion for an injunction, it appeared that the college was opened for the instruction of students in the month of September last, and that it has been in operation about ten months; but that during this time the students have attended lectures in the afternoon and evening, so that, as alleged by a majority of the trustees, they

have attended "two full courses of lectures" within the meaning of the act of incorporation.

It was, however, contended on behalf of the complainants, the minority of the trustees, and evidence was offered to show that, according to the usage of all medical and dental colleges, only one "full course" of lectures can be attended by a student during a single academic year, and that, accordingly, the candidates who have attended lectures but ten months, have not attended "two full courses" of lectures within the meaning of the act; that the conferring of the degrees will defeat the purpose, and be contrary to the desires of the persons who have contributed money for the support and uses of the college, and will not promote the advancement of dental science and art.

After hearing the evidence, the judge ruled that the words of the charter must be construed according to the usage of other medical and dental colleges, and that when so construed, the words "two full courses of lectures" mean courses of lectures extending over two academic years.

The injunction was accordingly granted, and it being the purpose of the parties merely to obtain the opinion of the court upon the true construction of the charter, the injunction was, by consent, made perpetual.

A. A. Ranney for the complainants, and B. E. Perry for defendants.

We have received, and are under many obligations to Dr. E. Q. Naghel, of New Albany, Indiana, for a cast of a mouth under treatment by him, consisting of two rows of teeth in the anterior part of the arch. This extraordinary development is occasioned by four (4) supernumerary teeth, two in the front row between the central incisors, and two in the posterior row, between the laterals. The development of the normal teeth is excessive, being a third larger in every direction. Dr. N. describes the individual as a "hideous" looking object, which certainly must have been the case, as it is one of the rarest specimens of malformation that has fallen to our lot to examine.

We are also under renewed obligations to Dr. F. R. Thomas, of this city, for a very fine specimen of deciduous incisors, united their entire length.

We received some time since one of Craig's microscopes, and have been examining some of the objects that are prepared by the manufacturers, as well as others. The instrument certainly magnifies more than any other similar microscope we have used, having but one lens, and being arranged so as to require no focal adjustment, it can be used by any one; it shows the blood corpuscles, the tubuli in dentine, and the cells in vegetable tissue, and when the price is taken into consideration, it being but $2.75, it is certainly one of the cheapest as well as the most useful nstruments offered to the profession. T. L. B.

Book Notices.

We have received the April number of the "*Deutsche Vierteljahrsschrift.*

It contains the usual amount of interesting matter, some of which we should like to transfer to our pages, but have only room in this number for a synopsis of contents.

The 1st article calls attention to the Central Convention of German Dentists, to be held at Frankfort-on-the-Main, with the different subjects to be brought up for discussion.

2d. Investigation of a Malformed Tooth of the Inferior Maxilla, by Prof Wedl, of Vienna.

3d. Contribution to the Pathology of the Teeth, by Dr. Hohl, of Halle.

4th. The Necessity for the Investigation of Extracted Teeth, by E. Mühlreiter, of Salzburg.

5th. Contribution of Cases of Retarded Dentition, by Dr. Fricke, of Luneburg.

6th. Gum Affections, by Dr. Hamm, of Altona.

7th. Aluminum Sets, by G. Blume, of Munich.

8th. Artificial Palate, by S. C. Benson, of Stockholm.

9th. Seventh Annual Report of the Austrian Dental Association.

10th. Nitrous Oxide, by Dr. Ad. zur Nedden.

11th. Notes and Remarks.

Constitution of the Charleston Dental Association.—We have received a copy of the above document, and are gratified with this evidence of activity among the members of the profession in that locality. The officers are—President, J. B. Patrick; Vice-President, W. S. Brown; Secretary and Treasurer, Theodore F. Chupein.

Correspondence.

DENTAL ASSOCIATION.

Mr. Editor:—Permit me to call the attention of the delegates to, and members of, the Dental Association which holds its annual meeting at Saratoga on the first Tuesday in August, to the desire intimated and expressed by some of making our next meeting additionally attractive and interesting by combining the social elements with our professional gathering, and to this end the Committee of Arrangements would suggest and urge the delegates and members to bring their wives and daughters with them, in the hope that by so doing additional interest will cluster around

our gathering, and add much to the pleasure and gratification to ourselves and those connected with us.

The committee will see that accommodations are provided for all who will give timely notice of their wishes, by addressing the chairman, stating what accommodations they require.

J. G. AMBLER, *Chairman*,
25 *W. 23d street.*

Selections.

CARBOLIC ACID AS A THERAPEUTIC AGENT.

Joseph Hirsh, in a paper lately read before the Chicago College of Pharmacy, gives an account of a series of experiments made by him, showing the power of carbolic acid to coagulate albumen, and adds some remarks upon the effect of this acid on the human system, the importance of which can hardly be over-estimated. The application of a concentrated solution of the acid to the skin produced in a short time a white opaque spot of horny aspect, which soon peeled off. The same spot produced on a highly sensitive part of the epidermis, as on the tongue, at once it loses its sensitiveness, and a feeling as of the presence of a foreign body as a coating is experienced. In both cases the opacity of the spot, by its resemblance to the opaque coagulated albumen, at once reveals the nature of the change produced by the acid. The albumen of the blood, which, through the numberless ramifications of the blood-vessels, is carried to the skin for its nourishment, becomes coagulated. In this state it is solid, precluding the motion of liquids of its own kind within its substance, and, with this motion, nourishment and life. As lifeless, dead matter, the skin must necessarily peel off; it must, with the loss of vitality, be deprived of all prerogatives of life, of feeling, as noticed above. Taking the coagulation of albumen as the immediate effect of applying carbolic acid to any organic substance, we shall find no difficulty in explaining the suspension of life, without its complete extinction, in the microscopical beings known as contagion. They contain, no matter whether they are animalculæ or minute plants, (a question not definitely settled,) albumen; blood albumen in the former case, and vegetable albumen in the second. Here the carbolic acid, coagulating the albumen on the surface of the corpuscle, forms an insoluble envelope, impenetrable to air, and to further quantities of carbolic acid, which in this manner forms an obstacle to the entrance of itself into the interior of the small body. This, then, retains in its centre a minute portion unchanged, full of life, capable of increase under favorable circumstances, and protected from external influences by its coating of coagulated albumen. Such a corpuscle, acted upon by carbolic acid, may be represented by an egg exposed to boiling water for a few seconds. The coagulating influence of heat affects the superficial layer of albumen, which still incloses the rest of the egg in its raw state. All substances or processes producing the same coagulating effect upon albumen, do, in reality, exert the same destructive influence upon contagion and miasma; but none possess other necessary properties qualifying them for this purpose as well as carbolic acid. Heat, which coagulates albumen, has been used successfully in the disinfection of places and clothing infested with

the poison of cholera, small-pox, yellow fever, &c.; but while we can turn high-pressure or even super-heated steam into a room, a ship, &c., we cannot subject a cholera patient, or an animal infected with the cattle-plague, to so high a temperature as to destroy the poison lurking within them; and if, in diluted carbolic acid we have a remedy which, with such coagulation, will destroy the activity of the contagion, without interfering with the process of life in the patient, we have found a desideratum which is at once a boon to mankind, and a victory of science important beyond comparison. Other chemicals, as the mineral acids, their salts, which coagulate albumen, precludes their use in contagious diseases, under the same circumstances, for similar reasons, under which super-heated steam is unavailable. On the other hand, carbolic acid in great dilution exerts a barely perceptible influence upon the vital processes of the larger animals, while its power of destroying sporules is almost equal to that of the concentrated acid. This apparent anomaly is easily explained on comparing its action to the parallel coagulation of a highly diluted solution of albumen by one similarly diluted of the acid. The diluted solution is as completely coagulated as a dense one; but the immense dilution places the particles of albumen at such great distances from each other that they can no more form a coherent mass after coagulation, but remain separately suspended in the liquid, rendering it opaque and milky in appearance. This liquid, although charged with insoluble albumen, will filter through paper, as also through the pores of all tissues of the animal organism. The dilute carbolic acid introduced into the system will, in the same manner, coagulate the albumen and sporules it meets on its passage in such subdivision that the coagulum can no longer form a dense coherent coating, as in the case during the application of the concentrated acid, while the minute particles of this coagulum, after filtering through the animal tissue, do not oppose an obstacle to the free passage of greater quantities of the carbolic acid or of the vital fluids. On the other hand, the sporules constituting the contagion are so minute themselves that the limited sphere of action of the diluted acid still embraces a complete sporule, or a number of them, which thus have their vitality suspended as completely as by the concentrated acid. The great divisibility (respective volatility of the acid,) prevents its complete neutralization by the albumen of the larger organism to the exclusion of that of the sporules, the albumen being a base of no great energy, especially if linked to as faint an acid as carbolic. Nevertheless, for a complete curative effect, the dose must be repeated, as the acid owns, in common with all other drugs, the property that the limit of its sphere of action is proportionate to its amount.

HEMORRHAGE AFTER EXTRACTION OF TEETH.

A correspondent of the *Lancet* writes, "troublesome hemorrhage sometimes follows the extraction of a tooth. A case of this kind occurred a short time ago, in which bleeding continued for six or seven hours, until it was stopped by the following treatment, the effect of which is immediate and permanent, and gives no pain. I have treated five cases in the same manner: soften a bit of white wax, and mould it into a conical shape, about an inch long, and press it into the cavity, at first lightly, and then very firmly, so as to fill it. Cover this with a thick pad of lint, to retain it in its place, and bind the jaws together for a few hours with some kind of bandage."

EFFECT OF LIGHT ON MINERAL OILS.

Herr Grotowsky, of Halle on the Saale, Prussia, has made some remarkable communications on the new property of hydro-carbon oils, which was discovered by him. In exposing various kinds of such oils to the rays of light in glass balloons, he invariably found that they absorbed oxygen, and converted this gas into its allotropsic condition, ozone. It was further ascertained that even the air was thus ozonized in well-corked vessels, the effect being to some degree dependent upon the color of the glass. The respective results were marked down after the space of three months. But before enumerating them, it will be proper to remark the term photogen is applied to oils from peat or bituminous coal, which distil between 212° and 552° F., having a specific gravity between 0.795 and 0.805. The name "solar oil" is given by the Germans to oils having a specific gravity of from 0.830 to 0.835, and distilling above a temperature of 550° F. The former are burned in lamps adapted for that object, the latter in Argand and Carcel lamps. The observations of Herr Grotowsky are the following.

1. Solar oil and photogen which were stored in barrels and cisterns, lined inside with iron, remained free from ozone, and could be completely burned.

2. Photogen and solar oil kept in balloons of white glass, wrapped up in straw, showed traces of ozone, but burned well otherwise. Both the color of the oil and that of the cork were found slightly changed.

3. Photogen and solar oil in balloons of white glass, painted black, showed traces of ozone. The oils were less changed than those noted in No. 2. The corks were not bleached.

4. Solar oil and photogen, which had been kept in unwrapped white glass balloons, were found to be strongly ozonized. They burned very badly, charred the wicks, and nearly extinguished the flame after burning for six or eight hours. The solar oil was turned strongly yellow, and showed an increase of 0.003 in its specific gravity.

5. Solar oil which had been exposed to the light in unwrapped balloons of green glass, gave strong indications of ozone. Though the wick became charred, the oil burned quite well, and was little changed in color.

6. Solar oil in balloons of green glass, painted black, was found to contain some ozone, but it burned perfectly well. That in green balloons, wrapped in straw, showed about the same results.

7. American kerosene which had been exposed to light in balloons of white glass, became strongly ozonized, so much so that it scarcely burned. The formerly bluish-white oil had assumed a vivid yellow tint, and its specific gravity was found to have increased 0.005.

8. American kerosene which had been kept in the dark for three months did not show any ozone, and burned perfectly.

The oils had been exposed to light from April to July, 1868. Those which had become strongly ozonized were changed in odor also, and the corks had become bleached, as if attacked by chlorine, while those in balloons, containing unaltered oils, were entirely unchanged in that respect.

A CEMENT FOR TEETH.—The French and German dentists prize highly the following formula as a cement for teeth: Finely powdered borax, 1 part; freshly calcined oxide of zinc, 9 parts; finely powdered silex, 2 parts; mix well together, and make a firm plastic mass.

DEATH FROM CARBOLIC ACID.

A London journal says that an inquiry was held on June 23d, by Mr. Richards, Deputy Coroner, at Sion House, Lower Clapton, relative to the death, from the inhalation of poison, of Mr. Capel Henry Berger, aged 28 years.

Mr. C. Berrow Berger, Sion House, said the deceased lived with him, and was a color manufacturer. He suffered for a fortnight past from a very severe toothache, but a dentist advised him to preserve the tooth and bear the pain. He was an accomplished chemist, and he tried all sorts of things to allay his sufferings. On Sunday, June 21, while at church, he had to sit in a great draught, and that brought on a relapse of the pain. In the afternoon he went to his room, according to his custom, and bolted himself in, for the purpose of spending some time in devotion. When his sister called him down to tea, she could not make him hear, and ultimately witness broke open the door, and found him lying dead on the floor, upon some flexible tubing which communicated with a bottle of carbolic acid. His face was quite black, and he had vomited. It was clear that he had died from the carbolic acid, but he had not committed suicide.

Dr. J. B. Metcalf said that the deceased had fixed an elastic tube, ten feet long, to a large glass jar of carbolic acid, and had then evidently seated himself in a chair, and had inserted the end of the tube in his mouth, for the purpose of allowing a drop of the liquid to fall on the tooth. He had a brass regulator on the tube to control the quantity of the acid, but it did not act efficiently, and the volatile poison overcame him, and he became giddy and fell. Being alone in the room, the poison continued flowing into his mouth, and the heart's action was stopped, and he died. The remedy which he tried was a new one, and the deceased was in the habit of recommending it to his friends. It should never be used without medical assistance.—*Med. and Surg. Reporter.*

FATAL HEMORRHAGE AFTER THE EXTRACTION OF A TOOTH.

Dr. Schunemann relates an interesting example of this occurrence. Its rarity may be judged of by the fact that it is the only case that has occurred among 9,442 tooth extractions performed in the Brunswick Hospital during 1859–'66. A molar tooth was easily removed from the jaw of a tailor, twenty-one years of age, on account of caries. The bleeding, without being great, persisted, in spite of astringents, and it was then stated that he, as well as his father and brother, were subjects of hemorrhagic diathesis. In the course of the night, severe bleeding came on, and he was brought to the hospital in an anæmic state, being scarcely conscious and his pulse hardly perceptible. The bleeding still continued, but was at last arrested by a conical cork plug. He was sufficiently recovered at the end of four days to leave the hospital, but having removed the plug next day, profuse bleeding came on again, and it could only be arrested after several applications of the actual cautery. His strength was reduced to the lowest ebb, but by the aid of stimuli he was rallied. At the end of three days, in spite of all warning, he again removed the plug, and the bleeding again recurred, and was arrested at the end of several hours by plugging and cautery. However, the patient's strength was too far gone to rally this time, and he died on the day week that the tooth had been extracted. The autopsy threw no light on the cause of the bleeding —*Med. Times and Gaz., from Virchow's Archiv.*

THE THREE VARIETIES OF DYSPEPSIA.

Dr. Henry Browne, M. A., Manchester, recognizes three principal kinds of dyspepsia, which he calls respectively sulphuretted hydrogen dyspepsia, or that accompanied with "rotten egg" eructations; carbonic acid dyspepsia, or that evidenced by tasteless eructations; and butyric acid dyspepsia, in which the eructations are sour or acrid. To a patient suffering from the first named of these, he recommends abstinence from meat and eggs, and prescribes farinaceous diet, along with a mixture containing strong hydrochloric acid, chlorate of potash, filled up with a vegetable bitter. In the case of patients afflicted with carbonic acid dyspepsia, he orders a lean meat diet, and an avoidance of bread, potatoes and farinaceous diet generally; while to the third class he prescribes the use of sugar and fat. Dr. Browne is fond of pointing out the incalculable harm done to the digestive system by an immoderate indulgence in tea, and in his, as in every medical out-patient room, he finds abundant illustrations of his observations. These cases he styles "tea dyspepsia," and he relies for a cure of them upon a daily allowance of wine, regularity of meals and abstinence from tea. He insists very strongly on the necessity of wearing flannel, especially in the rheumatic diathesis; enjoining upon his patients the use not only of flannel jackets or shirts, but also of flannel drawers and woolen stockings; and he invariably adds this precept—"Never wear during the night the flannel clothing you have worn during the day, but change your flannel garments night and morning, taking care to have them well aired and dried in the meantime.—*Medical Times and Gazette and Braithwaite.*

DEATH FROM HYPODERMIC INJECTION.

Lantesson reports (*Journ. fur Kinderkrankheiten*, 1868, 217—225,) that he saw a child die in a few moments with convulsions, after he had injected several drops of liquor ferri sesquichlor. for nævus maternus. Dissection revealed large coagula in the roots of the great veins at the heart, and in the right auricle and ventricle.

He supposes that a vein of some size was wounded, and that the astringent thus got into the general circulation, coagulated the blood, and finally produced paralysis of the heart. He recommends that the flow of blood into neighboring venous plexuses should be prevented by pressure when we perform this operation.—*Med. and Surg. Reporter.*

Dr. N. Field, of Jeffersonville, Indiana, states that a boy about five years of age, in apparently good health, was suddenly attacked with an epileptic fit. Two weeks after he had another strong convulsion. No cause for the attack was then discovered. In a day or two the fits returned, and were repeated at short intervals, so that in ten days he must have had a thousand. Every resource in Dr. Field's power was exhausted to relieve him, and three eminent medical professors examined the child from head to foot, but no local irritation was detected. After a convulsion had passed off, and while he was still unconscious, he raised the upper lip as high as possible, and behold! the corona of the canine tooth, instead of having caused, by its pressure, the absorption of the root of the deciduous tooth, had passed behind it and forced it through the alveolus and gum into the lip. It was removed, and the convulsions ceased altogether.—*Western Journal of Medicine.*

PENGHAWAR DJAMBI.

A writer in the *Missouri Dental Journal* recommends the application of the penghawar djambi in hemorrhages of the mouth. It acts promptly, is simple in its application, and there is no disagreeable taste nor unpleasant action observed in its use—objections which are often urged against other remedies of this class. This substance is the hair-like scales with which the stems of a certain species of tree fern, found on the Isle of Java, are covered. As found in commerce, it presents a soft, silky, fibrous appearance, resembling asbestos, except in color, this being of a brownish yellow. In cases where continued hemorrhage follows the extraction of teeth, if from the margins of the gum, a compress made of the broken fibre applied to the bleeding surface, and retained there for a few moments, will shortly arrest it. When the hemorrhage is from the bottom of the socket, the styptic should be rolled into a firm tent as large as the cavity in the alveolus, and long enough to fill it. Introduce the tent with a pair of pointed tweezers, and with a smooth, blunt-pointed instrument, force it down to the bottom of the cavity, and retain it there for a short time with a compress. It does not stain or tarnish the instruments used in its application, an objection to which all other styptics are liable.

THE FEMALE PHYSICIAN QUESTION ABROAD.

The University of Zurich has already conferred the medical degree on Mdlle. Souslowa. Her experience, and that of her companions in Russia, is not the least interesting episode in the history of medicine studied under difficulties. In company with several other ladies, Mdlle. Souslowa began her studies at St. Petersburg in 1862, and attended for two years the lectures on natural philosophy, chemistry, and anatomy, at the Medico-Chirurgical Academy, without objection either by the professors or their fellow-students. Suddenly, however, an order came from the Imperial Government forbidding the professors to admit women to the scientific class of the academy. The reason given by the Government, was that "women did better as such when they knew nothing, and understood nothing." With one exception the female students were thus compelled to leave the classes. Mdlle. Souslowa then resolved to try her fortune abroad, and after some delay gained admission to the University of Zurich, with the result as above stated. She now intends to seek admission once more to the medical examinations at St. Petersburg, in order to obtain a legal qualification to practice in her own country.—*Med. and Sur. Reporter.*

Tooth in Upper Lip.—*North Staffordshire Infirmary.*—(Under the care of Mr. W. H. Folker.)—"Albert H——, aged sixteen, joiner, was admitted into the above infirmary, on August 29, 1867, on account of a tumor existing in the substance of upper lip. The swelling was on the left of the median line, corresponding to the left central incisor tooth, and seemed to be formed of hypertrophied lip. It caused a good deal of deformity, as the patient was unable to accurately close his lips. The tumor felt hard, but was not painful. On carefully examining the swelling, a small aperture was perceived at its base; and, on passing a fine probe, a hard substance was felt, which was diagnosed to be a tooth.

"Aug. 31st.—An incision having been made through the tumor, a tooth

was found at its base. On attempting to extract it by the forceps, it was fractured; this proved to be owing to its peculiar shape, being of a crescentric form, and passing almost at right angles to the alveolus. After its removal the swelling disappeared, and the patient was discharged on the following day."—*The Lancet.*

CEMENT FOR BOTTLES CONTAINING VOLATILE LIQUIDS.—Chemists who have used a luting of melted sulphur for sealing bottles containing either, benzole, bisulphide of carbon, and other volatile liquids, will find it much more convenient and quite as effective to mix finely ground litharge and concentrated glycerin, and apply the mixture as they would paint around the cork or stopper. The coating soon becomes extremely hard and air proof, but it can be easily removed with a knife.

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PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Fourteenth Annual Session, 1869-'70.

PRELIMINARY LECTURES AND INSTRUCTIONS.—The Dispensary and Laboratory of the College will be opened on the 1st of September, where ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability; and during October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday in November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation,

and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

ANATOMY AND SURGERY.

The instruction in this department will embrace a plain and comprehensive view of the structure of the human body. The lectures and the demonstrations will be given over *the dead body dissected for the express purpose* of elucidating the subject. With the same object, vivisections on the lower animals, while under the influence of an Anæsthetic Agent, will be employed. Such description of the comparative anatomy, microscopical structure and connections of the teeth, as their importance may demand, will be fully given. The valuable and extensive collections of Anatomical Preparations of the incumbent of this chair, consisting of wet and dried specimens, papier mache manikins, models in wood, and accurate French plates, will enable him to illustrate his course of lectures very clearly.

In addition to the above course, a Surgical Clinic will be held by Doctor Forbes during every week, for the purpose of performing such operations in oral and general Surgery as may be deemed advisable to advance the student in this particular branch of knowledge. The cases will be selected from a dispensary which the Faculty have established.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical pecularities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND HYGIENE.

The intention of the course on PHYSIOLOGY AND HYGIENE will be to convey a knowledge of the essential principles of general and human physiology, in such a mode as will best develop their application to the preservation of health. The subjects of physiology and hygiene will be, to some extent, interwoven, with a constant aim at clearness and simplicity of instruction.

CLINICAL INSTRUCTIONS.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the Demonstrators.

In the Operative Department.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

In the Mechanical Department.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

Practical Anatomy.—The great facilities for the study of practical anatomy to be found in Philadelphia, in several well ordered and supplied dissecting rooms, present to the student advantages for its prosecution superior to those offered in any other city.

Hospital Clinics.—In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of dentistry, the celebrated hospitals and clinics of the city constantly enable the students to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Pennsylvania and Philadelphia Hospitals, two of the largest eleemosynary establishments in the world, are open to medical and dental students, free of charge.

FEES.

Matriculation, (paid but once,) - - - - - - - - -	$5 00
For the Course, (Demonstrator's ticket included,) - - - - -	100 00
Diploma, - - - - - - - - - - - - - -	30 00

TEXT BOOKS AND WORKS OF REFERENCE.

Leidy's or Gray's Anatomy; Carpenter's or Kirk's Physiology; United States Dispensatory; Pereira's, Biddle's or Stille's Therapeutics; Fownes' Elements of Chemistry; Regnault's Chemistry; Lehmann's Physiological Chemistry; Hartshorne's Principles and Practice of Medicine; Wood's Practice; Tomes' Dental Physiology and Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Wildman's Instructions in Vulcanite Work; Barker on Nitrous Oxide; Gross' or Erichsen's System of Surgery; Paget's Surgical Pathology, or other standard works on the subject.

QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupilage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before

the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

CANDIDATES FOR GRADUATION WHO HAVE NOT ATTENDED LECTURES.—Dentists who have been in continued practice since 1852, are eligible to be candidates for graduation without attendance on lectures. The candidate for graduation must present satisfactory evidence of his having been in practice for the allotted time, also of his good standing in the profession. He must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must present specimens of his workmanship. He must undergo a satisfactory examination by the Faculty, on each of the branches taught by them; when, if qualified, he shall be recommended to the Board of Trustees, and if approved, shall receive the degree of Doctor of Dental Surgery. Of this class of graduates, the matriculation and diploma fees only are required.

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THE

DENTAL TIMES.

VOL. VII. PHILADELPHIA, OCTOBER, 1869. No. 2.

Original.

THE ENAMEL MEMBRANE AND THE MEMBRANA PRÆFORMATIVA.

BY DR. KOLLMANN, OF MUNICH.

[Translated by Henrietta Hirschfeld, D. D. S.]

Dr. Zur Nedden, in the July number of the *Deutsche Vierteljahrsschrift*, presents to the readers of that journal an abbreviated statement of Dr. K.'s work, without expressing an opinion in regard to the conclusions arrived at.

According to Dr. Kollmann, the enamel membrane, in the shape of a structureless membrane, exists without doubt at all times of life, as well in the deciduous tooth, still hidden in the jaw, as on the long-used permanent one. It has an exceedingly small diameter, from $\frac{1}{800}$ to $\frac{1}{1000}$ millimetre. It may be detached in large patches of diluted muriatic acid —5 to 100, or 10 to 100, be used, and in a few minutes may be drawn off from the whole crown. The use of stronger acids is injurious, as the development of gases will burst the membrane at different points, leaving only microscopic patches, which might easily be overlooked.* This membrane was isolated with dilute muriatic acid by Berzelius and Retzius, (1837.) They believed it to be on the internal instead of the external surface of the enamel, and the latter thought it the remnant of the membrana præformativa described by Raschkow.

By the use of stronger acids only a structureless membrane is found, but when more diluted, there remain polygonal markings, corresponding with the transverse section of the enamel fibres, (Kölliker,) which are sometimes very distinct. These markings are, however, not pits, but the outlines of the adherent and very translucent enamel prisms. It is easy to see these delicate, nearly amorphic enamel prisms near the cracks. That this is the case is also shown by the absence of these markings at other

* Hence it is quite brittle, and the asserted resistance against acids has its limits.—Z. N.

places in the same specimen, they being perfectly smooth and structureless. The enamel membrane may be taken from the teeth of adults or children. A granulated precipitate may be seen according to the action of the acid, which is sometimes laid out in punctuated regular lines, as I saw it in a calf. Sometimes remnants of the enamel, and other cells of the adjacent tissue, adhere to the structureless membrane if it be detached from a tooth still hidden in the jaw.

It is hard to understand how Tomes, Waldeyer and Hertz could declare this enamel membrane to be an artificial product. The supposition that it was the least calcified layer of enamel is indefensible, since it can be taken off, by muriatic acid, from the approximal surfaces of teeth of persons forty years of age. Even after treatment with alkalies it keeps its nature, and does not split into cells. Kollmann mentions, to avoid misunderstandings in regard to the existence of that structureless, calcified enamel membrane seen by him, that on teeth, immediately after cutting the gum, a delicate membrane can be distinguished by maceration in dilute muriatic acid, which is composed of 3–6 layers of polygonal cells, similar to those of the mucous membrane of the mouth. It may be seen on half-grown milk molars in men and animals. Erdl* found and recognized it as being composed of little flat cells. This membrane is only a dense layer of epithelium cells of the gum, which remains as a tight-fitting cap on the tooth while cutting through the last envelope. This tough membrane is well known to most dentists, as they are frequently requested to remove that peculiar yellow cover from young teeth, and which decidedly distinguishes the half-grown tooth from its white neighbor. The layer of horny cells covers the glossy enamel, giving it a yellowish dead appearance. It is therefore certain, that on teeth where the crowns are half way through the gum, a membrane may be taken off consisting of the horny epithelium of the mucous membrane: but this is only possible for a very short space of time. Its origin is the epithelium of the oral cavity, and not that of the enamel organ. *Under this is the calcified enamel membrane.*

According to the author, the membrana præformativa is an artificial production of the preparation, but is, however, the *youthful condition of the enamel membrane.*

Kollmann tries to prove the supposition of an independent existing membrana præformativa to be incorrect.

It is known that an internal and external epithelium can be distinguished on each enamel organ, and between both the enamel pulps. A clear conception is required of the so-called internal epithelium and the

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* Erdl. Investigations on the Structure of the Teeth of the Vertebrata, especially of the Rodents. Munich, 1841.

stratum intermedium, which Kollmann considers as belonging to the membrana adamantinæ, or enamel membrane.

This internal epithelium consists—1st. Of a layer of cylindrical cells, which are directed with their wide free ends toward the dentinal pulp, (enamel membrane of authors.) 2d. Of a layer $\frac{1}{20}$ Mm, polygonal, radiating, anastomosing cells, which are in close proximity and granulated, (the cells of the adjacent enamel pulp are also radiated and anastomozing, but are further separated.) The close accumulation of the cells outside of the layer of the cylindrical cells, in fresh as well as in the dried state, is the reason why, on sagittal sections, this layer appears somewhat dim, and undoubtedly makes the impression of a distinct tissue.

Under favorable circumstances it is possible to draw this cylinder epithelium, and the adjacent denser layer, in patches from the fresh but especially from the hardened specimen of the enamel organ. This may be the reason why it is described by Todd and Bowman as "basement membrane," and by Hannover as "membrana intermedia." Waldeyer prefers to call the layer "stratum intermedium."

The cylindrical cells of the membrana adamantinæ strongly resemble those of the Schneiderian membrane. Toward the inside they are cut transverse, and this transverse section in four to six-sides spaces, and even round sections are to be found. The remaining part of the cell corresponds to the section.

The enamel cells have a membrane. Waldeyer, Hertz and Wenzel* have confirmed its existence at the side walls of the cells, and it will not be doubted by any one. The outer end of the cell, directed toward the stratum intermedium, is, as already mentioned, pointed and in direct connection with the processes of the polygonal, granulated cells of this layer.

Examination shows the contents of the cylindrical cells to consist of a molecular substance and a nucleus. Kollmann could not find the contents of the part near the enamel to be more minutely granulated. Nearly without exception, the nucleus is found in the part near the stratum intermedium. One glittering nucleus is nearly always found. He never saw two nuclei in one cell.

The investigation of the *free end of the cells* requires especial attention, for in the works of Waldeyer and Hertz† the observation is made, that this inner end is without a membrane. According to Kollmann, these cells also possess a membrane on their free ends, which is perfectly distinct.

We find in this case, as in many others, the contradictions arise from the different methods of investigation adopted.

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*Wenzel.—Investigations upon the Enamel Organ and the Enamel. Leipsig, 1867.

†Waldeyer.—Konigsberger Jahrbucher. Hertz. Virch. Arch., Vol. xxvii., 1866.

Kollmann has himself seen this inner end without a membrane, and is able to demonstrate it with and without a membrane. Tomes has found the enamel cells with wide borders toward the enamel prisms. Kollmann has observed the same, and has seen other cells with margins serrated like the calyx of the gentiana, and slightly turned back. At times the observer may be able to look down in the cylinder of the cells according to their position. This kind of cell termination is produced when the cell is isolated from the enamel on quite fresh specimens, or after short treatment with chromic acid. After a longer maceration in the already mentioned solutions, this separation occurs in a more delicate way. Then, however, the cells are not open, but covered with a distinct thick membrane of $\frac{1}{1000}$ to $\frac{1}{1200}$ Mm. These covers are very firmly united with the enamel, and it is only with especial caution that the separation can prove successful. Most of the observers have hitherto not succeeded; either the cell was torn off, so as to let the cover membrane adhere to the enamel prism, or the prisms break and remain in connection with the cell. In the first case, the cell is on its wide part without membrane; in the second, it is generally easy to detect the membrane between the enamel fibre in the shape of a light stripe or line, but it is either mistaken or not taken into consideration. Waldeyer,* for instance, has decidedly represented it in his figure 13, plate III., and on figure 10, of the same plate, is found a slight indication; but he says nothing about this line between cell and enamel prism. Hertz has given some thought regarding this line of demarkation. He failed to prove the membrana præformativa which should exist between enamel cells and enamel prisms. For this and other reasons he believes in a direct calcification of the enamel cells; but he cannot deny, that on young developing enamel the transition of the enamel cells into the enamel prisms is apparently *not a direct one.* He says, one sees, between two or more homogeneous chromic acid preparations, a light small zone, possibly resembling a membrane, which he could also sometimes distinctly demonstrate in isolating the single enamel cells in connection with the corresponding enamel prisms.

This light zone, figure 5, b, he considers as a part of the enamel cell, chemically different from the calcification of the prepared protoplasma layer. It is seen that this conspicuous light zone has not escaped the observer, and by repeating, without prejudice, the investigation of this critical spot, he will discover it to be the membrane of the enamel cell.

Kollmann has found that the cover membrane of the enamel cells may be removed with or without reagents, as a coherent pellicle, when the enamel is developed. Sometimes it is found detached in larger and sometimes in smaller spaces in the cells.

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* Konigsberger Jahrbucher.

Often the membrane is seen spread over, arch-like, from one group of cells to the other, when the cells in the gap have been removed by an accident. Those incredulous minds, who doubt the efficiency of the reagents, may succeed in taking off a membrane by pressure. Beneath, the cells will be found with their wide ends uncovered. This pellicle, which can be taken off from the cells of the enamel organ, *during the development* of the tooth, is soft and flexible; in short, a membrane composed of a multitude of cell covers, on which may at this time be proved the effects of silver. *After the completion of the enamel these cell covers remain on the surface of the tooth to calcify. This is the origin of the enamel membrane.*

Kollmann discusses the works of Huxley and Lent, which contain positive results. Huxley* has undoubtedly seen the enamel membrane on teeth of the seventh month. He states the thickness to be from $\frac{1}{1000}$ to $\frac{1}{625}$ Mm, as he and others have found it. He has adopted an excellent method to exhibit this. The tooth, taken from the alveolus, has to be observed by a slight magnifying power under water, with the addition of strong acetic acid. The consequence is the loosening of the still soft membrane, and the melting away, like snow, of the enamel prisms. He has shown this delicate, structureless membrane, which was previously demonstrated in 1839, by Nasmyth on Mammalias, to Messrs. Busk and Quekett.

To explain why it is that it may be found on the tooth still hidden in the jaw, says Kollmann: "It is above mentioned, that the connection between the cells and enamel prisms is so firm that in the fresh state the cells nearly always break in the middle by tearing off from the enamel organ. This connection is not dissolved even after a maceration of several days in a weak solution of chromate of potassa. As a proof of this it is only necessary to refer to Tomes, Waldeyer and Hertz, who give diagrams of cells, with adherent pieces of broken enamel prisms. When Huxley treated teeth taken fresh from the alveoli, with the adherent cells of the young enamel, with acetic acid, and observing them slightly magnified, the remnants of the cells disappeared, the enamel prisms became dissolved, but the existing cell covers, between the two elements, remained as a structureless membrane, called by Huxley membrana præformativa. Isolated in that way, it must not be considered an element of the tooth pulp, as it has nothing to do with that organ, it having originated from the enamel organ; but it is readily understood why every observer, under such conditions, supposed it to be a membrane originally covering the tooth papilla." This explains Huxley's remark, "that all the tissues of the teeth are formed beneath the basement membrane of the pulp;"

* Huxley on the Development of the Teeth.—*Quar. Jour. of Micr. Sciences*, 1853.

indeed, *beneath it* occurs the development of the dentine; *beneath it*, that is to say, through the cover of the cylindrical cells, that of the enamel. These views differ only in this: Huxley says, under the membrane of the pulp, while Kollmann says, under the cover of the cylindrical cells.

Lent* agrees with Huxley on this question, and remarks, "that the enamel is developed beneath the membrana præformativa, and that this membrane and the enamel membrane are identical." He supports Huxley in the view that the whole tooth pulp is covered with the membrana præformativa, and that the membrana adamantinæ is situated upon it. In treating a transverse section of a tooth, in the first period of its development, with acetic acid, he saw the structureless membrane detaching itself from the enamel. Having a tooth on which all the dentine was not yet covered with enamel, he distinctly saw the manner in which the membrana præformativa passed from the pulp to the dentine, and then to the enamel covering the dentine. This description would be perfect if, instead of the term membrana præformativa, we substitute Kollmann's description, as given above, for this embryonical condition, namely, the whole of the coherent cell covers of the enamel organ.

In accordance with the results obtained, the substances forming the crown of the tooth must be arranged in the following order: The dentine is developed from the tooth pulp, with the assistance of the dentine cells. The enamel is deposited on the surface of the dentine by the cells of the enamel organ. The same firm, durable agglutinant, which binds the enamel prisms to each other, also produces the solid connection between enamel and dentine. The enamel cells are the elements of a secreting organ—enamel organ—and we find on their surface the enamel prisms, cut corresponding to the transverse section of their cells.

BERLIN, Prussia.

ODDS AND ENDS.

BY E. WILDMAN, M. D., D. D. S.

In the following medley, I propose, from time to time, to lay before our readers a series of formula and other matters that may be of practical use or of interest, as may occur to me or may be transcribed from my note book, without much regard to systematic arrangement, trusting that, at least, some of the younger members of our profession will find something therein of value to them. In doing so, I shall give recipes that have been tested and found good, not offering any others unless especially noted, and those well authenticated.

* Lent.—Journal of Zoology, Vol. vi., 1855,

Cements.—Cements for retaining teeth to plate in fitting them down, or to try in the mouth before placing in the investment:

1. Gum Mastic, 8 parts.
   Yellow Wax, 4 "
   Color, q. s.
2. Gum Damar, 7 parts.
   Yellow Wax, 4 "
   Color, q. s.
3. Rosin, 2 parts.
   Wax, 1 part.

Nos. 1 and 2 possess very similar properties, being sufficiently adhesive and strong to answer the desired end, and are preferable to No. 3, on account of being firmer and more readily cleaned off the work, prior to applying borax. Gum damar being so much less expensive than mastic, I use No. 2.

To make these cements, place the vessel containing the wax and gum over a moderate heat, just sufficient to melt them, and stir until thoroughly incorporated; then add the color in quantity to produce the desired shade. Venetian red, drop lake or vermilion may be used. When all of the ingredients are well mixed, pour into a basin of cold water. To form into sticks, immerse the cake in water sufficiently warm to render it plastic. It is preferable to color it, as it renders it more sightly, and, also, we are better able to detect minute particles adhering to parts where solder is desired to flow and remove them. If desirable, it may be perfumed by adding an odoriferous oil just before pouring into cold water.

The following makes an adhesive cement of a dark color, which may be made more agreeable to the eye by the addition of venetian red or vermilion. It answers a good purpose to attach specimens to pedestals, &c.

4. Rosin, 4 parts.
   Gutta Percha, 1 part.

First melt the rosin, then add the gutta percha, cut into shreds and stir until they are united.

No. 5 is a good water-proof cement, but does not possess much strength; it will resist the action of water much better than shellac. An iron vessel coated with this composition will be protected from oxidization. In proof, I tested it on an iron frame aquarium which, after a constant exposure to water for four years, remained intact.

5. Pitch, 4 oz.
   White Wax, 2½ oz.
   Gutta Percha, 3½ oz.

First melt the pitch and wax together; then add the gutta percha, cut

into shreds, a little at a time, and stir until they are thoroughly incorporated.

To make a cement for building up pebble work, &c., for an aquarium, add to the above, after the ingredients are united, white clay, perfectly dry and finely pulverized, in quantity about one-fourth the weight of the mass. In using the pebbles or articles to be joined, they should be warm, and the cement, in a fluid state, applied with a brush to the surfaces to be united.

Cap Cement, (6,) so called by the late Professor Farraday. It makes a good strong cement to attach wood to glass. The parts to be united should be made quite hot, the cement applied in a fluid state, then firmly pressed together and retained until cool.

6. Rosin, 5 parts.
   Yellow Wax, 1 part.
   Venetian Red, 1 part.

The venetian red should be thoroughly dried and in a very fine powder, introduced a little at a time, and stirred into the melted mass.

Shellac Cement.—Gum shellac makes an excellent strong cement for joining small surfaces of wood together, and in many cases is far more convenient than glue. The shellac should be flowed upon the surfaces to be joined, and then they should immediately be pressed firmly together while the shellac is in a fluid state; in a minute or two the pieces will be found firmly united.

A convenient way of preparing gum shellac for laboratory use is to fuse the gum, as found in the shops, in a suitable vessel over a slow fire, being careful not to raise the heat higher than just sufficient to melt the gum, and, when fused, cast it in a mould; when cooled sufficiently to be plastic, but not adhesive, it may be worked into sticks. In manipulating this or No. 2, the hands should be kept moist with water.

Alum Cement.—This is principally useful to the dentist in securing an instrument to a pearl handle; it is strong and durable, when not exposed to moisture, and at the same time colorless.

Take the common alum crystals, place in a spoon over a quick fire; the alum melts in its water of crystallization so as to become perfectly fluid; while in this state, apply to the parts to be united and press together.

To produce a good result, the whole operation must be performed expeditiously, care to be observed not to allow the water of crystallization to be driven off, or the fluid to cool before the parts are joined.

To Polish Ivory.—Remove any scratches or file marks that may be present with finely pulverized pumice stone moistened with water. Then wash the ivory and polish with prepared chalk, applied moist upon a piece of chamois leather, rubbing quickly.

To Polish Pearl.—Take very finely pulverized rotten stone and make into a thick paste by adding olive oil; then add sulphuric acid, (oil of vitriol,) a sufficient quantity to make into a thin paste.

This is to be applied on a velvet cork; rub quickly, and as soon as the pearl takes the polish wash it. This mixture, when properly applied, will give to pearl a brilliant polish.

PROFESSIONAL INGRATITUDE.

BY SAMUEL WELCHENS, D. D. S.

In establishing a literature for the dental profession, the question of professional ethics has heretofore been too much neglected. A scientific status should be the leading characteristic; but no profession can control even that element, where there is a moral looseness in principle and action upon the part of its practitioners. If the man who seeks a profession as a vocation in life is void of the principles of a gentleman, he will not regard the rules which govern that calling any more than he would be likely to respect those which give character and dignity to society.

In the various journals which contribute so largely to a solid literature in dentistry, this subject should be more developed, so that persons seeking the endowments of the profession might learn to know how to honor and sustain it in *all* its parts while enjoying its emoluments. Let the leading and controlling power be scientific research; but, at the same time, as a growing interest is being manifested in that department, a corresponding appreciation of a high-toned principle of action, whereby the dignity of the profession, as such, ought to be maintained, should show itself, not only in the office of the practitioner, but it should be worked up in our literature, and be made a part of a real, substantial dental education.

Dentistry has attained its present high position among kindred professions with an amazing rapidity; but in no single quality has it shown such a nobility of character, as in the helping hand it has given to the worthy but poor aspirant to its honors. It has advanced in dignity and excellence, in the very effort of fostering in its less fortunate members, the principles of growth and prosperity which have characterized its own development.

The inventive talent within its borders has bestowed upon it the largest variety of appliances, which, being compared and adapted to scientific practice by skillful hands, many of them have become essential adjuncts in the dental office; and thus, by a power above and beyond the mind and skill of the ordinary operator, he is carried forward into an easy practice, in a profession which otherwise would have been beyond his power to obtain.

Its literature has so arranged and developed its science, that the most ordinary powers of mind can comprehend the whole scope of theoretical

knowledge necessary to a good dental education; and the more solid instructions of the colleges, and in the private office, which is offered and obtained at a very low rate of compensation, renders the dental profession not only a high-toned scientific pursuit, but its honors and emoluments are within the reach of any man who has ambition enough to raise himself above the position of a daily laborer. And when all this is obtained—when the amateur is once in the profession—he is still carried forward and upward in this career by the exercises of the local societies, and the more general benefits of state and national associations, which are so easy of access, and in which he gets the opinions and experience of the best and most distinguished practitioners "without money and without price." Here a fund of interesting and useful instruction is imparted, such as must develop the man and the genius, where a proper interest is manifested, or where the mind seeks that improvement necessary to success in any calling in life.

With all these advantages, however, with every help which is graciously tendered to bolster up those who are weak and scarcely able to reach a meritorious position, or to foster those who are more fortunate, we find a manifest gravitation of mind and energy toward the earth. A low estimate of their own worth, and a corresponding low appreciation of the true excellence of their profession, leads them to use their energies in running both down to the level of a handicraft or trade, and thus dishonoring themselves by abusing the benefits thrown out by better men, which invited them to rich feasts of comfort and honor. *Such men are guilty of professional ingratitude of the very worst type.*

Perhaps the standard of the profession has heretofore been too low. It may be that the very facilities with which men have attained to its endowments have had the effect of corrupting their minds in regard to its merits, and destroying the energies they should have devoted to the work of improvement and development.

But, then, the incentive to the maintenance of a good moral character and of self-respect should prove a safeguard to any vocation, especially if such calling is to shield its devotee from want and distress; and to give his business a good name and a good face before the public, should be the first and paramount consideration.

It is only when a due respect is shown to our business by *ourselves*, that we can claim a proper appreciation of its offices and benefits from a community. No man, loose of morals, who reels from day to day through the streets as an habitual and confirmed inebriate, can make society believe that he has a high respect for virtue and sobriety.

So, also, in a profession. If the motives and aspirations of a practitioner are of a grovelling character, and a low estimate is placed upon his work

and attainments, and a narrow, contracted view is taken by *himself*, as these may be exhibited in bad conduct, inferior workmanship *and low prices*, the same estimate will be placed upon them by the community in which he lives, and he himself will suffer loss of caste and practice, and his profession will be obliged to succumb to the pressure, and in the end go under.

Such a man, whether a graduate of a college or a boasted carver of his own fortunes, *is a quack and an ingrate*, in the broadest and most emphatic sense of the term. To sustain himself in his waning fortunes, he will advertize largely. He will profess special skill in this and that operation, known to no other person in the craft. Superior work is offered at ruinous prices, and then a rush of low, gadding, huckstering custom will feed the quack machine, only in turn to be cheated out of money and teeth both; while, in return for such service, they will be just so many living advertisements in the general scheme of poisoning the public mind against the concern, and of running the profession down. An individual who would practice dentistry in this way does not so much injury to himself, as he does the profession which has fostered and nurtured his imbecility, until he acquired strength enough to strike a most damaging blow at its very vitals. This is what we mean by the term "*professional ingratitude.*"

To secure that degree of respectability to which any high-toned vocation has a right to lay claim, those who are its legitimate representatives should strive to honor it, not only by the observance of a code of ethics, or the cultivation of a good moral character, but by a proper and beneficial dispensation of its offices, so that, in the honoring thereof, the public may not suffer from a misplaced confidence in a profession or trade designed for the public good.

If we would stand free of the imputation of ingratitude to the calling of our choice, and to which we look for a livelihood, a standard of excellence should characterize every operation.

The man who would excel in dentistry, and do honor to his profession, must have a special care for the permanency and beauty of his work. Perfection should be the standard, and while the operator is striving to please himself, he should aim to give full satisfaction to the patient also. The *first movement—the first operation*—whether temporary or otherwise, especially in the case of a new patron, is that which is to establish you in his confidence. With such a purpose and such energy, no matter how obscure his locality or name—how mean his facilities for educational pursuits—how low or destructive the prices for the work of quacks around him, he will be appreciated by those whose good opinion is worth having. It will not only be in the community where he will be thus appreciated, but he will always hold an honorable position in the estimation of the best

men in his profession. With these cardinal virtues, and a corresponding degree of energy, no man will do discredit to his calling, but he will make his mark as a *positive character*.

Negative, slothful beings, add nothing to the elements from which they derive a living. It is your *positive man* who stands forth on the roll of honor, when his profession has reached the summit of its power, and is prepared to distribute its blessings to those who have been faithful and true to its life, during the period of its development.

LANCASTER, PA.

THE AIR CHAMBER, OR SUCTION CAVITY.

BY W. H. TRUEMAN, D. D. S.

[CONCLUDED.]

In the practical application of the air chamber, we find quite a variety of ideas, almost every dentist having his own peculiar notions in regard to position, shape, size, &c. While it is impossible to suggest or lay down any inflexible rules in regard to these several points, there are some general considerations we will endeavor to give.

If we carefully examine the various forces at work to displace an upper artificial denture, we will find they come to a focus at a point on the median line, immediately behind the rugæ; and pressure at this spot will be found to more successfully oppose them than at any other. This, we consider, the best position for the chamber, extending from the rugæ, or a little posterior, to within from $\frac{1}{4}$ to $\frac{1}{8}$ inch from the edge of the plate. We often find it placed too far front, sometimes immediately over the rugæ—a position open to many objections. Their roughness and irregularity make it difficult to fit the edges of the cavity with sufficient accuracy; their soft and yielding nature allowing the edges to sink in, or the membranes to be drawn down, often give rise to considerable annoyance. The depressions, if accurately followed up by the plate, not only give more surface, but have a tendency to maintain the plate in position, an advantage entirely lost if they are covered by the chamber. And again, while the atmospheric pressure is distributed over the entire surface of the plate, we find there is a little more firmness immediately over the chamber. If the chamber is brought too near the front, the slight yielding of the gums, when the incisors are brought into use, allowing the plate to be tilted, will very often throw the posterior edge down, and destroy the suction. By placing it in the position indicated, we avoid this, and, in most cases, secure a smooth, unyielding surface for the chamber, at a point where its projection will be least noticed. As a rule, in all plates, partial or full, if we allow a margin of say from $\frac{1}{8}$ to $\frac{1}{4}$ inch between the edge of the plate and the chamber, it will bring it into the most advantageous position we can select.

In regard to shape, the usual form approaching somewhat the general shape of the mouth—a triangle, with the angles rounded and the sides slightly curved outward, is by far the most practical. Fancy arrangements, hearts, shields, &c., may do very well for show cases, but in the mouth we find the lines of beauty and comfort run in curves. Sharp angles should be always avoided if we study our patient's ease and comfort. The size of the chamber may be about one-sixth the surface of the plate inside the alveolar ridge. It is advisable to make them smaller when the patient has not worn a plate before, as each plate must have the chamber a little larger than its predecessor. About one-sixteenth of an inch is mostly sufficient, though some cases where the mouth is soft may require them much deeper. In such cases, or where extra suction is required, it is better to use a Cleaveland chamber, with a large recess, than to increase either the size or depth excessively. We should use moderation in all things; there is a limit when the increased size or depth of a chamber ceases to be useful. We should remember, when we increase the size of the chamber, we *decrease* the bearing surface of the plate; and with an increase of depth, we trespass upon the domain of that useful but unruly member, whose owner will be very apt to complain of any attempt to interfere with the constitutional right to freedom of speech.

At the present time, there are two forms of chamber in use—the struck up, or Gilbert's, and the soldered, or Cleaveland. The first, being simple and easily made, is more generally used; and while in most cases it answers very well, it has not the perfect suction obtained with the other. It is all-important the edges should fit accurately, a difficult matter when the chamber is struck up, as everything depends upon the zinc cast; and in many cases, especially deep mouths, with all our care the sand will displace a little, making it very hard indeed to obtain *perfect* casts—even in the most favorable cases, where the plate is carefully driven up with a sharp set, it is very difficult to secure accuracy. The bevel we are obliged to give the wax of the model, to enable us to remove it from the sand in moulding, produces a chamber which can be and frequently is entirely filled up by the membranes. These difficulties can be readily obviated by using the Cleaveland chamber.

Among the number of different methods in use for making them, the following I consider the most practical: Make the zincs (I always use two for all plates, band or suction) in the usual manner, and proceed to make the plate. When it is well struck up and nearly finished, select a piece of copper the size, shape and thickness of the required chamber; fix this to the plate in the position it is intended to occupy by tacking with a little silver solder, just sufficient to hold it, and strike it up lightly with the first zinc. Sometimes this striking up in bending the copper to the cast will throw it out of position; if so, heat it up at the blow-pipe,

and return it with the soldering point or pliers. Now, strike up on the second cast, so as to drive the copper well into the lead, and then with a graver slightly enlarge and deepen this depression, taking care not to injure the edges. Now, take a piece of plate to form the cover, several numbers thinner than that of which the plate is made, and strike it up; trim it down, leaving an even margin of about a line, no more than will be covered up in soldering. Now, remove the copper from the plate, and proceed to cut the opening in the plate with the plate-punch, or a fine saw, and finish up with the file, taking care to have it a little smaller than the copper, so as to leave a little recess all around. During this operation, the plate is often bent a little, and requires annealing and re-striking up. Before doing so, file the plate up to the marks, and finish it; then place the cover with the copper in the lead, and strike up all together, (hard,) so as to set the edges of the cover close to the plate. Now, place the plate on the plaster cast, and with a hammer make the edges of the opening fit accurately all around, and finish them up perfectly smooth with sand-paper. After scraping where the solder is intended to flow, remove to the charcoal, borax, adjust the cover, and solder carefully. Some little care is required in heating up to prevent the borax displacing the cover. A clamp might be used, but they are so apt to bend the plate; a slight pressure with the soldering point, until the borax is thoroughly dry, is far better. A little experience will enable the operator to dispense even with this. In laying it on the charcoal, care should be used to have the plate well supported, especially with silver, or it may alter the fit. If the operation has been successful, and soldered smooth, there will be very little finishing up to do. The solder around the chamber stiffens the plate very much, and enables us in gold cases to use a much lighter plate without losing any strength.

In case a plate with a chamber like this should require re-making, it will be necessary to first remove it, which can be done by laying it on the charcoal, the chamber down, and carefully heating up until the solder is fused, when a sharp tap on the cover will remove it without injury, so that it can be used again.

The recess around the chamber adds very much to its usefulness. In several cases I have improved the suction of vulcanite cases by cutting a groove around the chamber with an excavator; in these cases the chambers were shallow, and entirely filled up.

Objection has been made to the Cleaveland chamber that the suction is sometimes so strong as to produce pain; a difficulty very readily removed by rounding off the edges with a file.

Although apparently a great deal of trouble, a little practice will enable a skillful operator to make these almost as rapidly as the others, if we take into account the time required to prepare the cast.

AMERICAN DENTAL ASSOCIATION.

DENTAL PATHOLOGY AND SURGERY.

[We subjoin a portion of the excellent report made for the *Dental Cosmos*, by Dr. W. C. Horne. Had we space to spare we should be glad to lay the whole of these discussions before our readers.—Ed.]

Dr. Atkinson, in concluding his report on the above subject, remarked that—

In consequence of a very little study in this direction, he was no longer able conscientiously to destroy the pulps of teeth under any circumstances; and, in testimony of the confidence with which he relied upon the doctrines here enunciated, he would detail a case which occurred the previous Friday. Female subject: superior canine tooth, exposed pulp; bled: touched with creasote, which arrested bleeding; filled with oxychloride of zinc; proceeded to work in another direction till the filling had set; then cut away oxychloride, leaving sufficient for a cap, and filled with gold; and if it is not a success he should be very much disappointed.

Dr. Buckingham.—What takes place between the oxychloride and the pulp?

Dr. Atkinson.—There is an affinity between the hydrochlorate of zinc (the fluid used with the oxide of zinc) and the albuminoid substance of the pulp, and at the point where the satisfaction is complete of this affinity an insoluble pellicle is formed. Beyond this, on the inner side, the coagulation is less and less, becoming simply astringent, collapsing the capillaries, driving the blood column—blood corpuscles and all—into the venous radicles, until the recoil of the column by the *vis a tergo* of the circulation reopens the arterial radicles and the capillary system, re-establishing healthy circulation, without the possibility of setting up the inflammatory process, or inducing the exudation of a single pus corpuscle. In case of a very weak pulp, and strong and abundant solution of the hydrochlorate, the coagulation may be effected to the foramen.

Dr. Buckingham.—Is there any pain during any part of the operation when the pulp is in a normal condition?

Dr. Atkinson.—Exposure itself is an abnormal state; but I have no pain manifested by my patients, nor the patients of those who have faithfully followed my directions, as far as reported to me, and I have had many of these. The reason of there being no pain is the free use of creasote. I never purposely destroy a pulp, and that dentist is weak or wicked who would do so.

Dr. Bogue.—How would you preserve a pulp that is exposed and partly suppurated?

Dr. Atkinson.—That question can best be answered by detailing my procedure in just such a case. A portion of the pulp had sloughed away. I resorted to my usual treatment in such cases, sopping the pulp with creasote, and covering with cotton and sandarac varnish; this dressing was continued for three weeks; at the end of that time the whole of the body of the pulp was converted into a mass of carbolate of albumen, and came away upon taking hold of it, leaving the legs in the roots in healthy and sensitive condition. Six other pulps in similar condition in the same mouth, were treated in the same manner without appreciable loss of sub-

stance. He was down on the death penalty; as long as there is life there is hope. Every man in dentistry should bring all his best powers into exercise in the practice of his profession, or he is a sinner.

Question.—Does the application of creasote tend to lessen the vitality of the pulp?

Dr. Atkinson.—Creasote destroys the periphery, which must be thrown off; and a pulp may be thus destroyed by continued applications. Iodine has such an affinity for some tissues as to stimulate some and destroy others, according to the amount of vigor they possess; the sick being killed and the weak being restored.

Question.—Has not the liquid part of the oxychloride of zinc the same action as the creasote?

Dr. Atkinson had never known a case of even a similar action; identity of result is an impossibility, because each exerts it own specific function according to its nature. That they each coagulate albumen is certain.

Dr. Wetherbee.—Is it not true, that if the oxychloride of zinc is used, without any excess of the fluid, the same result may be obtained without creasote as with it?

Dr. Atkinson.—That depends upon the temperament; in a low organization such a result might be attained. I always use creasote with it.

Dr. Wetherbee, when he finds an exposed pulp which has not bled, applies the oxychloride directly to it, only using creasote when the pulp is exposed and bled by the instrument, (as will sometimes happen even to the most skillful operator,) and that merely as an astringent. If the chloride of zinc, in coming in contact with the pulp, produces the same result as the creasote, why should the latter be used, unless it is preventive of pain? Is it true that the occurrence of pain endangers the life of the pulp? He believed not; and whether he applied the creasote or the oxychloride directly to the pulp, there was commonly a twinge of pain, which soon passed away, and was followed by no ill results. In those families which had been long under his charge, and where the teeth were inspected at regular intervals, he did not have occasion to perform any operations of this character; they were confined in the main to new patients. During the past year he had found no case of death of a pulp treated by him in the manner described. When he first commenced this method, it was with hesitancy and misgiving; but it proved so satisfactory that he had gone on, and now believes that, whatever the pathological conditions, they can be conquered. And here comes a wail from some one who has been unsuccessful; but he would say to that man, the fault is your own. He accounted for this unsuccess by supposing that the mixture was too hard when applied to the pulp, or that the cap had been broken in inserting the gold filling. Such failures should not be charged upon the material which proved so successful in abler hands.

Dr. Buckingham said he had tried to follow out all the directions given with the greatest care, but had not had uniform results. No surgeon could prognosticate how any case would turn out; no more could any dentist. He took exceptions to Dr. Atkinson's view of the condition of the pulp as acted upon by creasote. After sloughing and the application of creasote, there must be a cicatrix formed; the pulp must have a natural covering; it cannot tolerate the presence of a foreign substance without some degree of inflammation, which was likely at any time to be waked up into an active state.

Dr. Atkinson said there was no cicatrix; merely a new coagulum was formed; a pellicle, taking the place of the natural covering, dentine.

Dr. Buckingham.—You cannot form a coagulum which will not allow fluids to pass through it; even if it was as thick as leather, fluids would pass through it. In this way he had lost a number of cases, and therefore could not report uniform success.

Dr. Wetherbee.—Suppose there is an exudation from the pulp, is there no provision for taking it up? The oxychloride of zinc is porous; the best ever made will absorb moisture, and for that reason it is the best material for capping tooth pulps. It will absorb *liquor sanguinis*, or anything else, from the pulp, which comes in contact with it. It is sufficiently normal to insure success; and he believed 100 per cent. of cases would succeed if the cap were not broken.

Question.—Do you admit that if there is partial suppuration the rest of the pulp may have recuperative power?

Dr. Wetherbee had never seen such a thing, and did not believe in it. There are three classes of exposed pulps which he believed amenable to treatment. The first, where there is simple exposure; to these he applies the oxychloride, pure and simple. The second, where the pulp is exposed and wounded so as to bleed; here he applies creasote as an astringent and hæmostatic, followed by the oxychloride. The third, where the pulp is congested and has given considerable pain; here he would use means to reduce the congestion, and then fill as before, with confidence of success.

Dr. Butler.—Do you still think that it is injurious to the pulp to fill the whole of a large cavity with the oxychloride?

Dr. Wetherbee, in reply, mentioned a case which had come under his care, where, the pulps being exposed, a former operator had filled the cavities entirely with oxychloride, and these fillings had been renewed at times for three years; when he (Dr. W.) examined them the pulps were found all dead, and he attributed this to the continued action of an excess of the hydrochlorate.

Dr. Butler thought Dr. Wetherbee's position questionable. How could it be known just how much of the material to use, if such different results followed? He had used the oxychloride both as a cap and for an entire filling, and had found it to serve equally well.

Dr. Pearce said he must confess himself one of those who were weak and wicked enough to destroy pulps. Experience had shown him that the treatment which had been detailed was not reliable. On several occasions he had found, on cutting into teeth which had been filled in this manner, that the pulps were dead; while in other cases they were alive. He had not seen much to give him more confidence in the process of capping with oxychloride than with anything else. The theory of capping pulps, carried out with various modifications of material, had been extensively experimented upon for many years past, but the success had never come up to the expectations raised. With this state of feeling on his part, he generally transferred operations of this character, which showed indications of possible success, to his associate, who had more faith in them than he had.

Dr. Bogue thought cutting into teeth to test their vitality mere boy's play. A spicule of ice applied to the tooth was always a satisfactory test of its condition. Where suppuration of the pulp had far advanced, he

did not believe it was amenable to treatment. He kept exceedingly careful records of every case of pulp exposure treated by him, and had not lost one case of a healthy pulp, using the same means as described by the previous speakers. He had not yet learned how to arrest inflammatory action in the pulp, and would gladly receive instruction on that point from any one who was capable of imparting it.

Dr. McClelland believed erroneous views were entertained concerning the therapeutic action of the oxychloride of zinc. With a healthy pulp, its therapeutic properties amount to nothing; its only value was in its adaptability; gutta-percha would be just as useful, if it were as easy of manipulation.

Dr. Truman said that the success of this use of the oxychloride of zinc must necessarily overthrow the practice of twenty years; and he was not prepared, from anything he had seen or heard, to assert that the filling of roots was a failure. All know that the removal of the pulp is a success, just as far as amputation in surgery is a success, because it is the best thing to be done under certain circumstances. The subject had been treated vaguely by individuals, who asserted dogmatically, without producing facts in support. One asserts that there can be no failure; another admits some; while a third finds the failures to outbalance the successes. There must be a level of truth somewhere, but at this stage we can take nothing about it to be settled; it would require years of observation and experience to arrive at any positive conclusions. The theory of capping, which had been tried for years, was now an acknowledged failure. He had tried the oxychloride for two years faithfully, and believed in it. He had had failures, and thought every one must have them. Certain conditions admit of its use. He had never yet found a pulp dead from its use; but it was impossible to tell what the result might be, and he did not believe that ill success could always be charged to malpractice. It may be that there is something in its antiseptic properties which will preserve the appearance of the tooth after the pulp is dead; but no one can tell what is its mode of operation. These questions should all be studied out at home, and we should not come here to propound theories without an array of well-digested facts to sustain them. American dentists are very far in the rear in their theoretical knowledge; as far behind the Europeans in this department as the latter are behind the Americans in practical skill.

Dr. Searle said that he had had opportunity, during the year, of examining two teeth, filled in 1862 and 1863, of which records had been kept. In that of 1863, superior second bicuspid, the pulp bled, was capped with oxychloride, and filled with gold. In 1869 that filling had been removed; the pulp was found to be living and healthy. This tooth was removed on account of neuralgia. In that of 1862, an inferior first molar, the tooth had ached; it was filled as before. The pain was intolerable for two or three hours, then ceased: there was no subsequent return of pain, nor any discoloration. This tooth had also been removed, and, on opening it, the entire pulp was found to have dried up and disappeared; there was no fetor. In other cases inflammation had followed, generally in a very few days; where it goes on for a number of days without pain, he feels no apprehension, the tooth generally dying quietly, without discoloration.

Dr. Judd said the question to be discussed is not whether the practice is always successful, but is it judicious? We amputate limbs, and consider

that practice judicious under some circumstances. Let us inquire of ourselves, is it of any importance to preserve the dental pulp alive? Is a live tooth any better than a dead one? He believed, from experience and analogy, that a live pulp *is* better than a dead one. Philosophically considered, the nutritive processes go on at all times in teeth, in their normal condition, even in the enamel. Some think that there are no such changes; but it must be borne in mind that the enamel, dentine and cementum are all made up of hard and soft substances, and no one will deny that all soft tissues change. Take the case of a tooth, the pulp canal of which has been filled; it remained quiet for years, but the patient having an attack of measles, an abscess formed; this showed the necessity of the pulp to preserve the tooth under unfavorable circumstances. He considered it of the first importance, then, to save pulps alive; in many cases they do live under the oxychloride, and likewise die, and so also with gold. Many times teeth, the pulps of which were never uncovered, die even when filled with gold. He was not prepared to say under which circumstances most dead pulps were to be found; it was certain they were to be found under both. It was always time enough to kill a pulp; but once dead, it can never be brought to life again; it was, therefore, a judicious practice to preserve all, if possible, alive.

Pathology is a complicated and unknown subject; less is known of it than of any other in the broad domain of medicine. A few isolated facts and a vast number of theories, are all that we have to show of it. The very first step, etiology, puts us at fault; we know so little, definitely, of the causes of disease. He was unable to give a definition of what a cell is, though Dr. Atkinson undertook to explain it. The general idea of a cell is, that it is a small body with a cell-wall, fluid contents, and a nucleus; that each cell lives by itself, and has an influence on its neighbors. It is the opinion of Virchow, that each cell dominates a certain territory around it. If this definition of a cell is correct, the idea that it is the ultimate anatomical element is inadmissable. It has been settled, by the observations of Agassiz and Beale, that there are lower elements than cells capable of performing the functions of development. The ova of turtles were innumerable, and so small that they appeared, under a magnifying power of 17,000 diameters, to be mere homogeneous particles of germinal matter, yet they were capable of true growth. We must not, then, accord to the cell the honor of being the germinal particle.

The most generally accepted idea of the day, as to diseases, is that they are due to microscopic animals and plants, developed in living tissues. His attention had been especially called to this subject by a paper which accidentally came into his hands from Italy; in which the author claimed the discovery of the cholera plant, in the mucous membrane of the intestines of the deceased, which he believed to be the efficient cause of Asiatic cholera. Salsbury took up a similar doctrine. Polly gives much attention to the discovery of agents to destroy these growths, sulphurous acid being found the most deadly to them. Dr. Truman takes the same view of the origin of the green stain on the teeth; we know that this destroys the texture of the tooth, while tartar protects the structure.

It was not unusual to find a condition of very high sensibility in a part of the dentine of a tooth, and very near it a tract, almost or quite free of sensibility; and the question has often recurred to his mind how to account for it. He had made a great many sections with the purpose of determin-

ing this point; in many cases tracts were found in which the dentinal tubes were entirely obliterated, the whole structure consisting of calcified matter as far as the tract extended. In one case two entire quarters of the section were found destitute of nerve tubules, while the other portion was plentifully supplied with them. This condition afforded the most satisfactory elucidation to his mind of the absence of sensibility in some portions of a tooth, and its presence in others, showing it to depend on the nerve filaments in the dentinal tube.

Dr. McDonnell.—In all modes of treatment success is variable, because the conditions are variable. He had capped teeth by different methods, and on opening them, years after, had found the pulps dead, without having shown any outward signs of change. During the past year he had capped twenty exposed pulps in the method described by the previous speakers; one of these he knew to be dead. In making the application, he found that the degree of pain was regulated by the condition of the pulp; when freshly exposed, the pain was very slight, but it was greater and longer continued in accordance with the amount of congestion. While he was a great advocate for saving teeth, he did not think that anybody could be always successful; much must depend on the condition of the patient. If the exposed pulps were healthy, not one in fifty need be destroyed; it were better to adopt the oxychloride process, and then, even if they do die, there will probably be no pain nor discoloration of the teeth. Where, from the general diseased condition of the pulp, he considers a cure impossible, he removes it; but believes more suffering is generally caused in extirpation than in applying oxychloride.

Dr. Searle inquired whether the application of either creasote or oxychloride to the pulp was not similar in effect, and whether they are compatible with it.

Dr. Atkinson said that anything which contracts the tissues is an astringent, and this is the effect of creasote; it makes a solid mass of the coagulable portion of the pulp with which it comes in contact; the excess acting as a stimulant on the capillaries until its power is exhausted. Exactly the same thing occurs with the hydrochlorate (not oxychloride) of zinc; they are similar in effect, and their mode of action is the same. Any agent which effects coagulation deprives the tissue of the power of forming globules of pus.

Dr. Buckingham.—When the albumen is coagulated, will it ever become soluble again?

Dr. Atkinson.—Yes and no, dependent on the extent of the coagulation. The territory in which nutrient action takes place is always a collagenic or mucous mass, whether that be in the general juices of the flesh, or the sarcode, or in the anatomical elements denominated cells, where function is more differently elaborated. We only know a tissue by its anatomical elements, and this difference is that which constitutes the character of the cells. In a general way, teeth may be said to be osseous tissues; but this is too crude a definition to be of service to the histologist, physiologist or pathologist. There are three forms of hard dental tissue, known by the character of their cells, viz: enamel, dentine and cementum, and they are but differences of degree of calcification, under the dominion of typal presence. The last of these is so nearly like the bone cell as to be readily mistaken for it upon superficial examination. The formation of cells is always uniform in each kind. There is no physical distinction

between a cell-wall and its contents; it appears to be a homogeneous mass, and there is no cell with fluid contents.

Dr. Judd repeated that he had seen but one instance in which two full quarters of a horizontal section were made of calcified tracts, in which the tubules were entirely obliterated, and this was a very uncommon condition, though small tracts of the same character were commonly found. Dr. Atkinson thinks that the dentinal fibrils are mere extensions of nervous matter; I believe that within the tubules are true nerve filaments. The first layers of cells forming the exterior portion of the pulp, called "germinal matter" by Beale, penetrate the tubules, forming the soft fibres of Tomes. It must be borne in mind that Beale's investigations, to which we have referred, were made long after those of Tomes, and with vastly higher powers of observation. Beale saw that the terminal point of the nerve fibre, as described by his predecessors, was really not a terminal point, but only the point where it breaks up into an infinite number of fibrils in the germinal matter of the pulp. Now, there is room in the dentinal tubules for whole plexuses of these minute fibrils, and it is reasonable to suppose that they enter the tubules in common with the germinal matter—the tubules measuring $\frac{1}{10,000}$ of an inch, while these minute nerve filaments are but the $\frac{1}{100,000}$. Further than this, Beale has enunciated the doctrine that there are no terminations to the nerve fibrils, but that, like the electric force, their circuit is continuous, so that there is no break in their attachment to the nervous centres. It is a principle of the Baconian philosophy that known facts are superior to theories; and he accepted the facts developed by the advance of scientific investigation as a far more satisfactory elucidation of the question of sensibility in dentine than any of the fanciful theories which have been proposed.

Dr. McQuillen said that, regarding those present as representative men, understanding scientific principles, and familiar with elementary knowledge, he should not address them as students just entering upon the consideration of such matters; but, paying a decent respect to the intelligence and acquirements of his auditory, would present what he had to offer as to those qualified to have views and opinions of their own. He differed, in some respects, from the opinions advanced by Dr. Judd in relation to the character of the dentinal fibrils. Tomes directed attention to the fact that dentinal tubules are occupied by fibrillæ, and Beale concurred in that view; while the former was disposed to regard them as nerve fibres, neither had *asserted* them to be such. Beale, indeed, has spoken of them as *germinal matter* from which the *formed material*, or completed tissue is made. Dr. McQuillen has seen these fibres in examining pulps, but is disposed to think they are fluid rather than solid during life, and that their solidity under the microscope is due to a change after the removal of the tooth, like the change in the blood by coagulation. We have liquor sanguinis present in the pulp, and therefore the analogy might hold. He advanced this view suggestively, as it is impossible to demonstrate the fluidity or solidity of the contents of the tubules during life, because the structure can only be examined *post mortem*. Ten years ago, in making an examination of the pulps of the incisors of the calf, he had found no well-marked connection between the pulp and the walls of the cavity in which it was lodged, except at the end of the root, where the organic basis of the dentine had been formed, with a very slight deposit of the inorganic constituents. On making a longitudinal

section of the tooth, the pulp could be drawn out of the cavity without any force being exerted. Indeed, the weight of the pulp was sufficient to dislodge it when the divided tooth was held in such a position as to favor it. The connection at the root, however, was invariably so firm as to require considerable force to sever it. Within the past two months, in making some injections of the pulps of calves' teeth, he had obtained similar results to those just described, and it induced him now, as formerly, to question, if the dentinal fibrillæ, which he had observed projecting from these pulps, were really extensions of the pulps, how the latter could so readily part from the walls of the pulp cavity, where it would be right to infer they would be so firmly secured. Gulliver could not have been more firmly fastened to the ground when each hair of his head was tied by the Liliputians, than a pulp would be to the walls of a pulp cavity if solid fibrillæ passed directly from it into each tubule. In stating these views, he merely offered them for what they were worth, and with a full recognition of the fact that one has no right, except inferentially, to draw deductions from observations on animals and apply them to man. He would, therefore, direct attention to the ease with which the pulps of human teeth can be removed with a barbed probe—an incomprehensible operation if the supposed connection really existed. Let any one attempt to remove the periosteum from sound bone where direct connection exists, and find the character of the adhesion.

But we are met with the inquiry, Can any other than nerve substance transmit impressions through the tooth? He could see no reason why it might not. The air transmits sound, by waves of vibration, and if one end of a long stick be placed near the ear, and the other end be scratched by a pin, the sound would be transmitted along the stick to the ear; and sensations, in a similar manner, might be transmitted through the tooth to an impressible pulp.

As to the advisability of using oxychloride of zinc, he believed in trying whether a thing was good or bad. He had tried this preparation on exposed pulps in a number of cases—in two instances in particular, which he had watched. After a month, the teeth were in a comfortable condition, and possessed evidences of vitality in color, sensation, &c. What the future results would be, time alone could reveal.

Dr. Truman said that when Tomes made his first statement in regard to nerve fibres, ten years ago, investigations had not been carried to their present degree. The method he had pursued was extremely imperfect. Beale endorses Tomes' view, but calls the tubular contents germinal matter, and proves his position by the experiment with carmine. Since Beale, Boll of Germany has written upon the same subject, in which he asserts the existence of the nerve fibres, and proves it by experiments on the rodents. In this country similar experiments had been made. He was not prepared to admit the correctness of Dr. McQuillen's position. The best method of observing these fibrils is to prepare a section of a fresh tooth, and treat it with hydrochloric acid; this will remove the animal matter, and bring out the fibres on the slide by thousands.* As they present the peculiar appearance of nerve fibres, he was satisfied that they were such.

*Some explanation of this report seems necessary, though in the main it is correct as it stands. I remarked these fibres were to be seen by thousands, and from their marked resemblance to nerve fibres, I supposed they were of that character. That they had been acted upon with various re-agents, terchloride of gold coloring them, chromic acid destroying them

Dr. Buckingham.—Is it necessary that a nerve fibre should be touched to cause sensation? It is not necessary. He favored the idea that the action in the cells is similar to the action in the galvanic battery—the wires representing the nerves. There is great similarity between chemical and physiological action. Where does the nerve fibre terminate? There is no necessity of its going to each cell, but only in its neighborhood; and the impression may be conveyed to any part, whether in a fluid or solid state.

Dr. Shadoan said that, in case of exposure, and the pulp membrane being wounded, his practice is very much like that of those who had spoken before him, with this difference: he applies creasote or carbolic acid until the hemorrhage has entirely ceased, then dries out the cavity thoroughly, and with a blunt-pointed instrument, of suitable size and shape, applies a single drop of collodion to the point of exposure, allowing the ether to evaporate; then, on applying the oxychloride of zinc, there is perfect protection to the nerve.

If the nerve is exposed, and not wounded, the application of the collodion will form an admirable protection from the immediate contact of the oxychloride. He found that, where this precaution was used, the pain is seldom appreciable, and often there is none at all. There is something in the manner of applying the paste. He found that the softer it is, the more pain and the less dense the mass when hard; and the harder the paste, so it is plastic enough for use, the harder it will become. There is no better way to apply it than by having all things ready to manipulate, and, having an instrument wound with a little cotton, dip it into a very thin solution of the fluid, and mop or wipe out the

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at the instant of contact. Taken in connection with the fact, that in a decalcified section these so-called fibres were plainly distinguished when properly torn, after Tomes' method; also, from the fact that on each fresh pulp drawn from a fractured tooth, they are plainly visible; and still further, that they are to be seen protruding from the tubes of every fractured piece of fresh tooth, render the conclusion unmistakable that the fibres developed by my process, if not nerve fibres, are at least the fibres that pass through the tubes. Since the meeting at which the above remarks were made, I submitted one of my specimens to the inspection of Dr. James Tyson, whose reputation, in this direction, as a microscopist, stands unrivalled in this city. He says: "I have carefully studied the portion of the tooth pulp you desired me to examine, and a number of my friends, of more or less experience, have also looked at it; and although we are all agreed that the *fibres present many of the characters of fine dark bordered nerve fibres in the fresh state*, we are unwilling to declare them such without further study of the pulps in different media." The italics are his. This opinion is a just if not a correct one, and it was all I expected from the single specimen presented. The course of investigation on this subject covers, with me, a period of over two years, and while I agree with Dr. T. that, in some respects, they do differ from fine dark-bordered nerve fibres, they differ equally as much from yellow elastic tissue, the other element they somewhat resemble.

But it is not my intention, at the present writing, to enter into a discussion on this much-disputed question. I only desire to give my process for removing all the animal matter in the tooth but the remains of the pulp and these fibres. It is simply to use hydrochloric acid of nearly *full strength*. The tooth is cut down longitudinally until the pulp is reached on both surfaces. It is then clamped by a spring to the glass slide, and placed in the acid. The action will not cease until every particle of the inorganic and organic material is removed, excepting that above mentioned. The time occupied in this will be proportioned to the strength of the acid. I prefer that this should be somewhat diluted, as that of full strength is apt to carry the process too far, and requires more careful watching. With acid of full strength, ten hours will be sufficient, but I have had the best results when kept in a weaker solution twenty-four hours. It is a singular fact, that the pulp and these fibres will remain for a week in the weaker form of acid with but little change. As soon as the pulp lies on the slide separate from other tissue, it is to be removed and subjected to the fumes of ammonia, then very carefully washed in clean water, covered and prepared for preservation. This has been a difficult part, and I have not yet been able to add anything as a preservative fluid without injuring the character of the fibres. They disappear entirely in glycerine, Canada balsam, &c. Carbolic acid solutions do very well, but great care must be observed in manipulating, or there will be displacement and injury. With this process adopted on *entirely fresh* teeth, the fibres will be present, in good specimens, in countless numbers, at times matted together, at others extending out, entirely isolated from each other. Bone can be treated in the same way, but my investigations have not gone very far in this direction, but sufficiently so to make me believe there is much yet to be learned in regard to that tissue.—J. T.

surface of the cavity, and apply the paste; then gently tap the tooth, and the paste will settle nicely and uniformly to the bottom of the cavity. If the paste proves rather soft after applying it, the excess of fluid may be taken up very readily by pressing some spunk or bibulous paper upon the surface. Oxychloride of zinc is valuable in filling the pulp chambers of teeth where the roots have been filled. It makes a firm foundation for the filling, and arrests thermal shocks, which are sometimes troublesome where the gold is continuous from the crown to the apex of the root.

Editorial.

A PARTING WORD WITH OUR READERS.

For several years as assistant, and for the past eighteen months as principal editor of the TIMES, I have been brought into intimate relations with a large circle of its readers. The position, though at all times one of labor and anxiety, has been both pleasant and profitable to myself, and I hope has not been without good results. It has been my endeavor to make this journal a combination of the practical with the theoretical, so that the two large sections in our profession might each receive that suited to their taste. That the success in this effort has been only partial, I am fully aware, but that some valuable truths have been enunciated, must be apparent to those who have carefully perused these pages during the period first named.

The issuing of this number closes my connection with the TIMES. Circumstances, beyond my control, require a severance from the duties so long performed, but in doing so it is with no intention of retiring to inaction. The activities of the age require each one to labor to the best of his ability, and to neglect no opportunity for good. I shall, therefore, use the pen as time and inclination prompt, and give that work through proper channels.

To those who have so largely aided my efforts as contributors, I return my most grateful thanks, and hope they will continue their labors for this and other journals, nothwithstanding such work may not receive the full appreciation it deserves, at the hands of the careless reader.

The next number of the TIMES will be under the charge of another person, and *I wish it distinctly understood that my responsibility ceases with the present issue.*

The years that I have been connected with this journal, in various capacities, have been full of encouragement to all earnest workers. The process of elevation has been of slow but healthy growth, and as year has been added to year, there has been a corresponding increase of intelligence. In some respects, perhaps, there has been degeneration. The mechanical

department has suffered much in that period, but the gain in other directions, in my judgment, counterbalances this apparent loss. By a united effort we may still further advance, and make our loved profession honored and respected, wherever dentistry is known.

JAMES TRUMAN.

THE AMERICAN DENTAL ASSOCIATION.

The recent meeting of the American Dental Association, at Saratoga, was one of those pleasant interchanges between distant members of the same profession that necessarily can occur only at such a gathering. This is certainly a great, if not the greatest value, attached to such meetings.

While they are, theoretically, the channel through which the best and advanced thoughts of the members may find a circulation, past experience has shown that this has not been the case, and it is highly probable never will be, until a radical change is effected. There are good reasons for this apparent anomaly, the most prominent undoubtedly is the delay in publishing the proceedings. While a form suitable for preserving these in a permanent manner is advantageous, it has serious objections, one of these being the time necessarily consumed in their preparation for the press. Very few can be found who would willingly spend a large amount of valuable time in the investigation of a doubtful point, or who, having made undoubted discoveries or improvements, would be satisfied to wait six months or a year for their publication. Yet this is constantly the result, and after this period very few of those who really need the information ever get it, or if received at all, it has been shorn of its value by more recent and fresher work. It is to be hoped the time will come when this plan will be abandoned, and the work performed will go directly to those who require it, either through the agency of the dental journals, or else in a cheap form suitable for general distribution.

Such modes of advancing intelligence may have suited the pre-telegraphic age, but they have nothing to do with the active mental growth of the present time. The nearer and more quickly the combined active mentality of such a convention is brought in contact with that of the recipients, the better for all concerned. Those who are able to attend such meetings, and they are comparatively few, find ample return for the time and money spent in the interchange of views, the social reunions, and the *all* that goes to make such a gathering one to be looked forward to with pleasant anticipations, and to be remembered as hours full of profit and pleasure.

The discussions, the two days we were present, were marked by considerable ability, and were to us of great interest. It was apparent that,

as a profession, we are growing with a rapidity that promises a near future that will develop results commensurate with the increasing intelligence.

The report on pathology, read by Dr. Atkinson at the first meeting, led to remarks from various members, and took a wide range before the conclusion of the subject on the second day. The application of oxychloride of zinc, as a capping for exposed nerves, was dwelt upon at length, but we imagine with no definite result. It is too soon to dogmatize upon this treatment. Time alone can now solve the problem, and it would be perhaps wiser to carefully experiment and wait results. Many able practitioners were, however, fully satisfied with present experience, and had no hesitation in declaring the destruction of the pulp and the filling of the canals to be a practice of the past. We regard all such statements not only extravagant, but exceedingly injurious.

Dr. Palmer presented to the notice of the members diagrams and models, representing, with remarkable exactness, the various forms that caries assumes in its progress through tooth structure. We have never met more beautiful or exact imitations of nature than these specimens. Dr. P.'s idea was to exhibit the importance of removing all decay, following it up into the fissures, or wherever the faintest indication of a dark line may exist. It may seem surprising to some that so much labor should be needed to illustrate so plain a requirement; but it is undoubtedly true that an immense amount of bad work goes daily out of the hands of dentists, because they either will not appreciate this work, or are too careless to perform it. We have labored faithfully to impress the value of this fact for years, but have found great difficulty in securing a realizing sense of its paramount importance. It was therefore with no ordinary gratification that we witnessed so convincing a demonstration from one of the unquestioned ability of Dr. P. A vast many more teeth would be saved in this country if just such models could be lucidly explained to every association in the country.

Before leaving the Convention we felt it our duty to protest energetically against the incorporation of "permanent members" in the Constitution, which it was understood would be taken up for consideration at a future meeting. It must ever be a drawback, to all bodies of this character, to have a convention within a convention; or, in other words, two sets of members. The name "association," as applied to this body, is certainly a misnomer; that implies a voluntary union for a specified object, while this body is a delegated one, receiving its power to act from the local associations represented. It is therefore palpably improper to have men there who may or may not be members of local societies. It was therefore with gratification that we learned that the Constitution, as

finally adopted, while it did not remove entirely the objectionable feature, placed the whole matter on a more satisfactory basis.

We also took the liberty of introducing the following resolutions:

WHEREAS, The recent action of two of the oldest colleges of dentistry in this country, in admitting women to the full honors and duties of the profession, renders it imperative upon this national body to also take some action looking toward their admission into full fellowship in the profession; therefore be it

Resolved, That in view of the successful results attained in the education of women as dentists, we recommend to subordinate Associations to admit to full membership any woman duly qualified.

Resolved, That no considerations of sex should ever be permitted in consultations; ability and moral character alone being the standard of judgment in all cases.

The subsequent dodging of this question by the Convention, under the plea that they had no jurisdiction of the matter, was simply fleeing to Coward's Castle for refuge. It they had any opposition it should have been met openly, and not subject themselves to deserved contempt by the course adopted. That they had sufficient "jurisdiction" to recommend, cannot be doubted; that they could do anything more than this was not supposed. This question may be choked down for a few years, but that the time will come, and that speedily, when such narrow-minded selfishness will have an end, there can be no doubt. The progress of the age will properly level all such assumptions of superiority, and bring men to reason upon this subject in the light of that common justice that should exist between man and man. It is a question that far transcends many that are considered of vast moment, and we trust time will bring all to view it in that light, and treat it with some degree of manly courage and liberality. J. T.

DR. BLACK'S ARTICLE ON GOLD FOIL.

We hope none of our readers will pass over Dr. Black's paper, which we transfer from the *Missouri Dental Journal*, of July, to our "selection department." We deem it the most valuable production on this subject that has yet appeared, and enables us to explain much that has heretofore been involved in considerable obscurity. Whether his remedy to overcome the effects of the deposits on the foil will prove successful, remains to be proved, we think, although he has no doubt in regard to its efficiency. If, by the moderate use of ammoniacal fumes, our gold can be kept in good order until wanted for use, the fact will prove of great value to those obliged to keep it on hand for long periods of time.

WE are under obligations to Dr. F. R. Thomas, of this city, for additional abnormal specimens. Some of them are particularly valuable for their rarity.

S. S. WHITE'S NEW MOULDS OF TEETH.

We were exceedingly gratified a few days ago in inspecting new moulds of teeth prepared by Mr. Eli T. Starr, of S. S. White's manufactory. They excel, in our judgment, *anything of the kind heretofore attempted.* Modeled in almost exact imitation of nature, they present an artistic finish worthy of the highest commendation. It has been the opprobrium of all tooth manufacturers from the beginning, that while the anterior teeth simulated nature very nearly, the bicuspeds and molars were like nothing on earth, and we doubt anywhere else. Mr. Starr has succeeded in producing that slight inequality so common in superior laterals, and also in the inferior incisors, a feat in moulding that we consider remarkable. The inferior eye teeth are made to resemble nature, which, it is hardly necessary to say, they have not done heretofore.

We advise all who have not seen these teeth to call and examine a really beautiful work of art. The gratification that we enjoyed in a few moments' examination brought forth this *unsolicited* expression of it. Any genuine progress is worthy of every encouragement, and we think this is certainly one of that character.

Book Notices.

A Treatise on the Diseases and Surgery of the Mouth, Jaws and Associate Parts. By James E. Garretson, M. D., D. D. S. Philadelphia, J. B. Lippincott & Co., 1869.

We have received from the publishers the above volume of 700 closely printed pages. We regret that it came too late for an extended review in this number of the TIMES, and must therefore content ourselves with a brief glance at the contents.

The author prefaces it "with the hope that the volume will be a useful text book in assisting the student to prepare for the responsible duties of the profession, and a reliable guide to the intelligent practitioner."

That our readers may form some idea of the scope of the work, we subjoin the headings under which the different subjects are treated: Surgical Anatomy of the Mouth and Face, Dentition, Associative Lesions of First Dentition, Anomalies of Second Dentition and their Surgical Relations, The Teeth and their Diseases, including Alveolar Abscess, Trismus, Caries, Odontalgia, Salivary Calculus and Denudation, The Extraction of Teeth, General Anæsthesia, Salivary Fistulæ, Gums and their Diseases, Caries of the Maxillæ, Necrosis, Tumors of the Mouth, Exostosis, Exostosis and Subacute Inflammatory Tumors, Epulis, Osteo-Sarcoma, Osteo-Carcinoma, Epithelioma, Tumors of parts associated with

the Mouth, The Antrum of Highmore and its Diseases, Neuralgia, Wounds of the Mouth and Associate Parts, Ozæna, Fractures of the Maxillary Bones, Operations upon the Lips and Cheeks, The Tongue and its Diseases, The Aphthæ, Ranula, Palatine Defects and their Treatment, Resections of the Maxillary Bones.

It will be seen that to treat these subjects in detail in a satisfactory manner, requires ability of a theoretical as well as practical character, of a high order, and that the author has succeeded so well, with such a variety of subjects, requiring a variety of talent for their successful treatment, is sufficient commendation.

In those chapters more directly of interest to the dentist, we look in vain for that fullness of statement which properly belongs to a work designed to illustrate the latest thought on this particular branch. In a word, it seems to us that the author has confined himself too much to his own experience, not giving the recent work of other minds.

In the chapter on Caries the question is discussed as a chemico-vital action, and "markedly a trouble of hereditary transmission and predisposition." Upon these premises the author founds his explanation of the action of caries. He believes that in the depressions of the teeth are lodged "the various injesta of diet, acting, of course, as irritants, and producing, as I believe, just the same character of effects as would be produced in any bone; that is, inflammation, yet modified, of course, by differences which exist between the tooth bone and ordinary bone. It is, however, inflammation in the one case, and inflammation in the other; the matter of acids and alkalies have little to do with the matter, except as they are agents of irritation." In proof of this broad statement, "the resistive ability of common healthy dentine, from which enamel has been cut, so as to make the surface a self-cleansing one," is brought forward. According to our view, this is a feeble support to so positive a statement. The mere assertion that inflammation of dentine is the cause of the destruction found in teeth, predisposed by hereditary transmission, will not, we opine, carry with it much force. It is the same old statement, with no new facts to support it. We were in hopes to find, in opening at this chapter, at least a brief resumé of the more recent work on this subject of European observers. We speak of these, because we are not aware that any really fresh views have been promulgated upon this side of the water. We find nothing of the investigations of Tomes, Neumann, Leber and others, but have in their place the very valuable paper of Dr. James Paul; valuable in its suggestions, but leaving us as much in the dark as ever in regard to the immediate cause of the destruction manifested. While it is universally acknowledged that hereditary transmission is a predisposing cause of caries, the theory that acids have nothing to do

with it, except to irritate the tissue and produce inflammation, is an erroneous one, in the face of all the facts that have accumulated upon this subject. Whether Leber's views, founded on thorough investigation, can be sustained or not, it must be evident to any candid mind that they are *based* on facts that *cannot be gainsayed*, and we think they should have had a place in a work of this character. Any neglect of this kind very properly subjects the author either to the charge of ignorance, or else a desire to sustain a previously formed theory. We are not prepared to believe either of these conclusions applicable in the present instance.

In the chapter on Alveolar Abscess, we notice an allusion to a small operation for its treatment, that goes far to indicate a want of exact information that is hardly excusable. He says: "take up a spear-pointed drill, and pierce through the outer plate of bone in the cavity which the sac is being developed; break up this sac, and by means of a delicate tent keep the wound patulous for a few hours. * * * This little operation is, I believe, original with myself; indeed, *I do not know that it ever has been performed even yet by any one else.*" We must take exception to this conclusion in order to set our friend right. The operation has been constantly practiced for the last twenty years at least, and we presume all intelligent practitioners have recourse to this operation whenever necessary. Such loose statements are objectionable, as their tendency is to throw discredit on more important matters.

That portion of the work devoted to the treatment of caries by filling, will hardly be considered full enough for a text book. Indeed, we think it might have been omitted altogether as far as any practical advantages are likely to accrue to the student. The statement that the filling of teeth "requires only practice to become a proficient," is certainly unworthy one standing as high as the author. It is placing an important and extremely difficult operation in a contemptuous light, though such may not have been intended. *Practice never made perfect in anything.* It only *confirms.* Proof of this is unnecessary. It must be apparent to every observing mind that a half century of practice will not improve an operator if he fails to intelligently use present attainments as a base for further acquirement.

Under the head of Gums and their Diseases, we find, in writing of tartar, the following: "it is very common to observe a greenish deposit, particularly upon the robust and uncleanly, which, so far as I have observed, seldom results in any particular harm." This is a statement liable to most mischevious results. That it is without a shadow of fact to sustain it, must be true to every observer. That the injurious results may be slow in very dense teeth, may be admitted; but that this extremely acid matter can be deposited anywhere, and not result in injury, is not

credible in theory, nor is it borne out by observation. It is notoriously the *most destructive of all the depositions*, being largely composed of fungi, that exist only in an acid menstruum. It is certainly the very best illustration of the destruction of tooth structure, by an acid deposit, that we have; and it could be used as a forcible illustration of the weakness of our author's argument in his chapter on Dental Caries. We lay particular stress upon this statement, for this work will be extensively read by students, and will most certainly mislead them in this particular to their own and patient's great injury.

But we have not space or time to enter into a criticism of the work in detail. We have selected some points that we consider as blemishes. It is not possible to expect or to attain perfection in a work of this magnitude, and we did not look for it. As a whole, we deem it a most valuable addition to the very meagre stock of dental literature, and we feel that Dr. Garretson deserves the thanks of his colleagues for his laborious efforts to bring together so much valuable material for their instruction, and, may we say it, elevation. It should be in the hands of every dental student, but is perhaps better adapted to those whose experience enables them to critically discern errors of statement, some of which we have felt it our duty to point out.

We have received the July number of the *Deutsche Vierteljahrsschrift*, für Zahnheilkunde. Its contents are as follows:

1. Programme of the Annual Convention of the Central Association of German Dentists, to convene at Frankfort-on-the Main, in August.
2. A case of alveolar hemorrhage, by V. D. Tanzer, M. D.
3. The Philadelphia Dental College, by Dr. Adolph Petermann.
4. A reply to the opinion of our colleague, Humm, in regard to the loose thoughts of Dr. Hollander, by F. Kleinmann, of Flensburg.
5. The enamel membrane and the membrana præformativa, by Dr. Kollmann, of Munich.
6. A case in dental practice, by Dr. Tanzer.
7. Dr. Hofmockl, assistant surgeon in the surgical department of Professor V. Dumreicher, reports in the Vienna Medical Weekly, March 20th, 1869, a rare case of loss of speech in consequence of chloroform narcosis, for the purpose of extracting a sore, decayed molar. After two months of clinical treatment she was still unable to produce a sound. The patient is a girl of eighteen.
8. Miscellaneous.
9. Extracts from the proceedings of Dental Associations, and synopsis of American Dental Journals. We observe, Dr. Zur Nedden sharply,

and we think justly, criticises Dr. Cutler for his failure to give more than his mode of preparing a pulp for microscopic investigation, after he had *promised* to publish his mode of discovering the *millions* of nerve fibres.

10. Vegetable parasites of the human body, by Professor E. Hallier. This is an interesting and valuable article, but we are not able to transfer it to our pages in this number.

Selections.

GOLD FOIL.

BY DR. G. V. BLACK.

The first important question to the dentist after having received his gold foil from the beater or dealer is, how can it best be kept in good working order. If it is not kept in good condition, it matters little how or in what form it may be prepared, all operations with it will be faulty.

First, then, in learning how best to preserve the working properties of the gold, it becomes important to study intimately those influences which may be injurious, learn, as far as possible, what they are, how they act, and where they come from; then we may find the proper mode of counteracting them. First, we find that gold possessed of good welding properties gradually loses that important requisite by continued exposure to the ordinary atmosphere. In some cases this may be due to dust collecting upon it in such a manner as to prevent the surfaces from coming in intimate contact, thus preventing a union; but we have abundant proof that there is a far more subtle influence than this, and one far more difficult to counteract, for dust may be excluded with comparative ease.

The fact that gold loses its welding property by exposure to the atmosphere, points us directly to the effects of the gases upon it, especially those that may be found in the air as impurities; for the reason that by close observation we find that the atmospheric effect differs very materially at different times. You all know how common it is to find your gold, which worked well yesterday, work very badly to-day. Why this difference? is a very important question. It will be my effort to point out some of the causes for these differences, and the remedies, as far as I may be able. In prosecuting this enquiry, I have instituted a long series of experiments, in which I find certain gases neutral, others decidedly injurious, while others again seem possessed of a beneficial action.

Among the neutral gases stand all the simple or elementary gases except chlorine, the action of which is remarkable, and will be briefly considered farther on. Among those detrimental, all those gases containing phosphorous or sulphur stand prominent, while ammoniacal gas seems to stand almost alone as beneficial.

Many substances are neutral which might be supposed to be injurious. For instance, gold foil soaked in tincture of iodine, dried, and then annealed, is rather improved than injured, if any difference. The same is true of carbolic acid, ether, chloroform, alcohol, water, and most other substances usually found about the dentist's case.

The neutral gases need not be considered, but I will notice a few of those of decided action, giving the form of an experiment with each.

Sulphurous acid gas is produced directly from the burning of sulphur in the air, and is composed of one atom of sulphur united to two of oxygen; is possessed of decided acid properties, and has the smell of a burning match, and is produced in the dentist's office every time a match is lighted.

Experiment.—A test tube was filled with this gas by heating together oxide of manganese and flowers of sulphur, and some ropes of gold foil, part annealed and part soft, introduced. After standing twenty-four hours, it was removed and examined. The soft gold, on being annealed, gave off the gas sufficiently to be very noticeable to the smell, and with a slight crackling sound. The welding property was tried, and although it adhered somewhat, it was easily pulled apart again. The annealed gold was found perfectly soft—would not weld any more than so much tissue paper. On being re-annealed, it gave off the sulphurous fumes, &c., as the soft gold, but there was no restoration of the welding property by means of heat. You will notice the difference in the action of this gas on annealed and unannealed gold; and I will state that this distinction was plainly marked in all my experiments with this gas and some of the others.

And when I come to speak more particularly of annealing, I will give some reasons why it should be so

This gas is a dangerous one to the operator, for it is not only produced from burning matches, but is constantly exhaled from all sorts of rubber goods, with which the dentist's office is generally well stocked now-a-days. It is given off in very appreciable quantities in the trimming and finishing of rubber plates, in vulcanizing, and in all the operations with rubber, and wherever it may be. The truth of these statements is easily tested. For this purpose I placed some litmus paper in a drawer containing the rubber used as coffer dam; in a few days it was completely reddened. Some gold placed in the same drawer was affected similarly to that exposed to pure sulphurous acid, though not to so great an extent. In many of our cities the air is often rendered more or less sulphurous by the burning of sulphurous coal, and from other causes the air is often charged with this gas.

It is a somewhat curious fact that sulphur may be wrapped in a rope of gold foil and then burned out without injury to the gold, but this becomes plain when we find that this gas will condense on gold, or affect it only at comparatively low temperatures.

Phosphorus experiment.—A bottle was filled with phosphoric acid by burning phosphorus in oxygen gas, and some ropes of gold foil hung within for a few hours, after which it was examined. The annealed gold was found soft, and re-annealing failed to re-develop the welding property. The unannealed gold also refused to weld after being annealed, even at a bright red heat. After the bottle had remained uncorked ten or twelve hours, more gold was hung in it with precisely the same result. After the bottle had stood for one week, more gold was hung in it, and the effect found to be the same. Phosphorus is employed in making matches, and is given off in the form of this gas whenever they are burned; it is also formed from the spontaneous combustion of phosphoretted hydrogen gas, which is produced from the decay of animal and vegetable matter, together with sulphuretted hydrogen. Thus we see we cannot consider ourselves entirely free from it at any time, and that it will ruin the welding property of our gold.

Sulphuretted hydrogen experiment.—A test tube was filled with sulphuretted hydrogen by decomposing muriatic acid with sulphuret of antimony, and some ropes of gold, part annealed and part soft, placed within. After twenty-four hours the gold was removed and examined. No change in the appearance of the gold was observed. On bringing the rope into a strong alcoholic flame there was a distinct crackling sound, and the rope was burst open in a number of places by the escaping gas, which burned visibly. It does not seem to be driven off until a bright red heat is produced. The welding property could, in no one of the experiments, be reproduced by re-annealing the pre-annealed gold. In some cases there was a feeble show of adhesiveness in the unannealed gold, after annealing, but not enough to be of any practical advantage. After digesting the rope in aqua ammonia for a few minutes, and then drying at a gentle heat, a white sublimate is obtained on annealing, which may be collected on a cold glass held above. This is probably the sulphide of ammonia. If any one should be skeptical in regard to the actual condensation of the gases upon gold foil, this experiment must be sufficient proof to do away with all doubts, particularly when a similar phenomenon occurs with some other gases. This gas is exhaled in large quantities from all decaying animal substances, and the air generally contains some of it, though the proportion is usually small. But it is clear that it has a tendency to condense upon the gold, and may be collected upon it from the air. And then it may be actually produced in the dentist's office. Blood left in a spittoon over Sunday, or even over night, in warm weather, may exhale enough of this gas to spoil all the gold exposed to its action. It may be exhaled by old teeth, or any animal matter whatever, which may, by any oversight, be left until putrefaction takes place.

The effect produced by burning matches seems to be very irregular, sometimes being that of sulphurous and again that of phosphoric acid, and sometimes different from either. The effect is almost uniformly ruinous on recently annealed gold; but soft gold will sometimes weld after being subjected to it and then annealed, and again it refuses to do so, and again it occasionally happens, that ammonia fails to effect a restoration. The ruinous effects of the exhalations from the skin are well known to the profession, and need not be dwelt upon in this paper. My experiments confirm the generally received idea that they are always injurious, and further, that if the gold be long exposed to them, the welding property will be entirely destroyed.

Many other gases might be mentioned, but I have discovered no others which are liable to be brought in contact with the gold, that exert any decided injurious effect.

Carbolic acid gas softens annealed gold, but the welding property is immediately restored by heat.

Common illuminating gas produces a peculiar spotting of the gold, making it look as if mercury had been sprinkled over it; these spots disappear before a moderate heat, and the gold is apparently uninjured.

Ammoniacal gas, or its solution in water, is found to be rather beneficial than otherwise, in its action on gold foil. It condenses on and removes the welding property of cohesive gold; but a very moderate heat will remove the ammonia, and cause the cohesiveness to return. When this property is lost by contact with some one of the gases mentioned, the condition may be improved, and the welding property entirely restored, in

many cases, by treating it with this gas. It will be seen that all those gases which are liable to come in contact with our gold and injure it are acid gases, which combine readily with ammonia, as an alkaline base to form certain salts. Those containing sulphur form sulphides or sulphates of ammonia, while phosphoric acid forms phosphate of ammonia.

With these facts before us, we cannot be at a loss for a moment in regard to its use. If ammonia be present in excess, we may be sure that any of the gases mentioned will be neutralized, and our gold perfectly protected.

It thus becomes an ever wakeful watch-dog, ready to step in at our bidding, take possession of our property, and destroy any intruder before harm can be done, and again deliver it up to us when it may be wanted.

A small bottle of ammonia set in the gold drawer, loosely corked, will be found sufficient to protect our gold from all harm.

Chlorine.—Chlorine gas, from its very decided action, possesses a peculiar interest, although it is not met with in the free state, and, therefore, is not liable to come in contact with our gold. I will give merely a synopsis of its peculiarities.

A bottle was filled with chlorine gas by the usual method, and a number of sheets of gold, in the form of rope, placed within it. After a few hours they were examined. The lustre of the gold was very perceptibly changed, being dull and of a different shade of yellow; when brought in contact with the skin a deep stain was produced, resembling that of iodine. The instrument with which it is handled turns black. Litmus paper is reddened quickly when both are dry; damp litmus, bottled with it in a clear bottle, is first reddened, then turns almost white. Paper dampened with a solution of iodide of potassium and starch is first blackened, but afterward shows a variety of colors, among which a very brilliant yellow is conspicuous; a piece of black velvet was changed to a very light brown; a small piece of the same was put into a very small tube, and the gold pressed in against it—after a few hours it was almost a clear white; the same was repeated with the gold and cloth perfectly dry—several days were required to produce the same result. The welding property of the gold was entirely lost, but was completely restored by re-annealing; when heated to redness a copious green flame is given off, which turns red when the heat is intense, presenting a beautiful appearance. When soaked in aqua ammonia, slowly dried, and then annealed, a white sublimate is obtained, which may be collected upon a cold glass held above—a single sheet of gold giving off enough to form a complete crust over a space of two to three inches in circumference; this substance is probably the chlorohydrate of ammonia. When a little water is poured over the gold in a test tube, it takes a yellowish color, almost identical with that of olive oil. I find that on the addition of water, the chlorine instantly attacks the gold and dissolves a portion of it, which it carries into the water, giving rise to this peculiar color; pure chlorine water is almost perfectly clear. Gold subjected to any of the sulphur gases is cleaned, and the welding property restored by subjecting it to chlorine and then annealing; but it fails in case of phosphoric acid.

I had hoped, in the first of my experiments with this gas, that gold treated with it might be employed for the purpose of bleaching discolored teeth; but the fact of its carrying a portion of the gold with it when moisture is present precludes its use, on account of the brownish stain

imparted by the gold. I hope this difficulty may be overcome, thus giving us a safe and efficient bleaching agent, which may be used without the least inconvenience to the patient.

Annealing.—The annealing of gold has received considerable attention from the profession, but perhaps not quite as much as it deserves, considering its great importance. The changes effected in gold foil by heat have been differently explained by different persons, and as yet there seems to be no received or fully accepted theory in regard to it. It is true we all know that the direct effect of annealing is to develop the welding property, and if this fails we conclude that there is something wrong with the gold; it has been thought that heat acted upon the arrangement of the atoms of the metal, producing such a condition that when brought into contact with a similar arrangement, the particles composing the two surfaces would interlock, and be held firmly together. This theory might seem to be supported by the fact that heat applied to large pieces of gold, or to plate, has the effect to soften them, evidently producing some molecular change—yet that there is another cause for the development of this peculiar property, I think is fully proven by the effects of the gases.

The welding of pure gold foil is prevented by the gases being condensed on its surface, thereby preventing intimate contact; the direct effect of annealing is to drive off such gases, and render the surfaces clean. To prove this, take a rope of gold foil, anneal it in a bath of dry carbonic acid gas for an hour or more; upon trial its cohesiveness is gone; you may put as much force upon it as you like, it will not weld, but is, perhaps, much softer than before annealing; bring this piece again under the influence of the ordinary annealing heat, and the property returns at once and as perfectly as before.

This experiment may be varied by substituting other gases for the carbonic acid, with a like result; some of the gases, however, refuse to be entirely driven off by the ordinary annealing heat, and if we experiment with them, the welding property does not return, as we have seen in the foregoing.

In case of chlorine, the condensation is so great as to perceptibly change the color of the metal, and when expelled by heat the voluminous green flame gives us the idea of a very considerable condensation. While the gas is on the gold, it is perfectly soft—will not stick together any more than tissue paper, though it might have been in a fine cohesive state only a few minutes before; as soon as the gas is driven off the property returns.

There seems to be a question as to the best heat for annealing. This, in my opinion, will depend entirely on the gas that may have possession of its surface. If it be carbonic acid—which is usually the case—the heat need not be raised quite to redness, for we find that gas to be driven off at a low temperature; if it be sulphuric acid, it should be heated as hot as possible without melting the gold, and kept so for some minutes, and even then it may not be perfectly cleaned. This is very much like the melting point of metals, or the boiling point of liquids—some melt at one point, some at another; some liquids boil at one point, and some at another. It is the same with the gases on gold, some are drawn off at a low temperature, while with some others the metal must actually melt before they leave it.

The gases do not leave the gold instantly at a given temperature, but the first is expelled at a comparatively low heat, and they continue to leave

it as the heat rises, until they are completely driven off. This enables us to acquire any degree of adhesiveness we may desire. Some parts of a filling may best be made of non-adhesive gold, while other parts require a perfectly coherent mass. By practice, all the gradations of adhesiveness may be attained and used with perfect facility; for this reason the alcohol flame and the annealing of each piece of gold as it may be wanted for use is to be preferred over all other methods.

It has become a custom to say that annealing gold hardens it. This is only true in appearance; the gold is actually softened, just as it is in plate. The gold appears stiffer for the reason that the laminæ of foil stick together whenever they come in contact, instead of sliding easily upon each other as in the case of unannealed gold; this gives the impression of increased hardness, while the facts are just the reverse.

The use of gold rendered adhesive by the beater seems to me to be unadvisable, for the reason that such gold is affected more and easier by deleterious agents in the air than soft gold. In all my experiments there has been a marked difference in intensity and quickness of action of the gases on annealed and unannealed gold; the recently annealed gold always suffering most. This is explained by the fact that any deleterious gases coming in contact with it finds its surface and its pores, (if they exist,) unoccupied, and consequently no resistance to its action. All plastic golds are affected by the gases to a far greater extent than foils, for the reason that their structure is so much better calculated to absorb and retain them. This needs no farther explanation, being palpable to every one; it makes the great difficulty of keeping these forms of gold in good working condition quite clear. I think that if those preparing this form would keep it strongly scented with ammonia, and the dentist do the same, until it is ready to be annealed preparatory to using, this difficulty would be entirely overcome.

Forms of gold.—A few words may be said of the manner of handling and forming the pieces of gold. This may be stated as a positive rule to which there should be no exception: that gold foil, the welding property of which is to be made use of, should never be touched with bare fingers, for the reason that the exhalations from the skin always injure this property more or less. The gold is easiest and most perfectly worked with the fingers neatly gloved with fine chamois skin or linen. These gloves should not remain on the hand any longer than is actually necessary to do the work, and should be very carefully kept. It may be thought that it would be inconvenient to handle the gold in them, but this soon wears away with practice, and becomes easier and the results more satisfactory than with any of the gold crumpers that I have seen. I notice some ingenious Yankee has gotten up a patent instrument for rolling up the ropes, which consists of two boards with a strip of rubber stretched between. This may produce a very nice rope, but after studying the effects of rubber on gold, I should not prefer it to the fingers. We should remember that it is not moisture merely that injures our gold, for that is driven off by annealing; but it is the gases and solid residue from these exhalations, compared with which the sulphurous acid exhaled on rubbing rubber is no improvement. I would kindly suggest that he substitute a nice piece of chamois skin in place of the rubber.

The Block.—This form is best made by taking the amount of gold wanted in a single piece, and crumpling it loosely together, and then bringing it

into a square form with a pair of flat-bladed thumb pliers. The whole operation should be conducted in such a manner that the finished block will be of equal density throughout.

Ovoid Pellets are made in the same manner as the block, except that they are rolled to the desired size and shape—round or oblong—with the gloved fingers.

The Rope is made by folding a sheet or part of a sheet of gold loosely together into a long round roll, and then twisting it into a moderately compact rope. It is also made by rolling the gold in a napkin, and by crumpers, but much the best form is produced by the fingers gloved with chamois skin or linen.

The Pellet is produced by cutting the *Rope* into short lengths. I am using a pair of shears prepared with a graduated scale attached to one of the blades, with which the length of each pellet is definitely and easily measured as it is cut, without any loss of time whatever. This is a very convenient and useful instrument to those who may wish to adopt definite sizes of the pellet.

The Ribbon is best produced by using two prism-shaped blocks of convenient lengths, (one side about half the length of each of the others is the most convenient form.) A paper knife or ivory spatula may be used instead of the second block. The gold is laid on a piece of velvet, the thin edge of one of the blocks placed on its centre—the second block is now passed under the edge of the sheet, which is folded over the first, which is withdrawn, and the gold brought down smoothly by passing the block over it. This operation is repeated until the desired width is obtained, and the ribbon is ready for use. I know of no other mode of producing ribbon which can compare with this for perfection or ease to the operator.

The Cylinder is made by rolling a ribbon smoothly and compactly upon a broach or four-sided drill, as a ribbon is rolled upon a block, then by rolling the broach or drill backward it is loosened, and the cylinder removed. The width of the ribbon should equal the desired length of the cylinder. Many other forms have been used, more or less, but they are generally modifications of those given, and hardly require separate consideration.

The form in which gold foil may best be used in filling teeth, is a question of no small importance, and deserves much careful consideration. We want that form which may best be impacted securely and perfectly into grooves and retaining pits, and against the walls of the cavity. Compared with these points solidity itself is a secondary consideration. If our form of foil should not admit of the ready accomplishment of these objects, our whole work is liable to fail, no matter how solid other parts of the filling may be, or how beautiful it may appear. To meet these requirements our form of gold should be very impressible, and take readily the form of the wall of the cavity against which it may be impacted. These requirements seem to be most perfectly met by the form of the block. This form of gold is soft and sponge-like, may be pulled this way or pushed that way with the plugger, and adapts itself most perfectly to the walls of the cavity, but has the objection that it requires more labor to consolidate it perfectly than most other forms, on account of the many wrinkles and sharp angles which must be beaten out. This objection is perhaps much greater in theory than in actual practice, and whether it is or not, the impac-

tion against the walls is of much more importance, as before stated, than the actual solidity of the body of the work; provided always, that the solidity is sufficient for the ordinary wear and tear of mastication, which is easily attained with these blocks. The working of the ovoid pellet is about the same as the block. The next form nearest resembling the block is the pellet. This form is not crumpled quite so much as the block, yet is almost as soft, and is well adapted to working into small cavities or retaining pits, grooves and undercuts. The use of pellets cut from ropes larger than these made from a single sheet of No. 4 gold is objectionable, on account of the condensation which occurs at the ends of the pellets in cutting them. The ease and rapidity with which they may be prepared is quite an item in their favor, in all cases where small pieces are needed. The rope has been much used in times past by beginning with one end and folding it into the cavity, condensing each fold as it is laid in. I think this practice is mostly abandoned on account of the obvious difficulty of keeping the rope free from the moisture of the mouth, and that it obscures the cavity too much.

The cylinder is a very popular form of gold with many operators, and seems to have been gaining ground for a number of years. It is used by setting it on end in the cavity to be filled, and condensing against one of its walls, or if it be an approximal cavity, by laying the end of the cylinder out over the wall. With this form of gold there are no angles to break down in condensing, so that the solidity is attained with less labor than with most other forms in use. In fact, the gold is placed in the cavity in a very smooth and compact state, so that little more condensation is required, and is generally used in pretty large masses, particularly if the cavity be large. It is not so easily impacted into any irregularities which may occur in the walls of the cavity, although in the main very great solidity is attained. At those points along the wall where two cylinders lie against each other, triangular openings are liable to occur. In case of approximal cavities where the plan is to lay the ends of the cylinders out over the walls, this may result in serious mischief. This may be illustrated by taking three little rolls or cylinders of paper, with square ends, and placing them together, a triangular opening will be observed in the centre; or if you take two of them and press them together against a flat surface, a similar opening will be observed between them. It will be found a very difficult matter to close these openings perfectly and solidly by any practical amount of pressure. If the space be filled at all it is apt to be filled very loosely. The difficulty is not lessened by substituting gold for paper, and I consider it a very grave objection to the general use of cylinders in filling teeth, especially in approximal cavities. I have myself been greatly mortified to find fillings which I had thought very perfect, imbibing moisture, causing decay to start, evidently from this cause; and have also noticed it in fillings made by some very fine operators. To overcome this trouble requires considerable manipulative skill, and much good judgment, and even then it seems to be a somewhat dangerous form of gold to use largely.

The ribbon cut in short lengths or folded in as rope, may be used in filling teeth; but is scarcely applicable to the filling of cavities, for the reason that it is too much condensed, and too many hard corners are liable to occur to allow it to be spread and impacted perfectly against the walls of the cavity. This form of gold cut into convenient lengths may be used

with great advantage in building up lost parts of teeth, after the cavity has been filled out even with the walls. In such cases the slips may be laid on smoothly, and condensed with less labor than any other form of gold. There seems to be very little attention paid by dentists to the size of the pieces of gold used; or, I should say, they do not adopt any regular system of sizes, but prepare their gold according to the size of the cavity to be filled. Now to prepare gold in such a manner as this, seems to me to be forever experimenting with vague and undefined sizes. And we cannot feel that degree of confidence and thorough knowledge of what is coming under our instrument that we should. I would recommend every operator to adopt some regular gradation of sizes which may be found convenient, and adhere to them closely in all their work.

A few weeks' observation will be sufficient to determine upon those sizes which will be most convenient for their range of operations. Then a known and fixed size of gold will be chosen to be worked to a given place as the eye may dictate, and there will be no vagueness as to the working of the piece under the instrument, for it will be perfectly familiar. Those who have not tried this plan will be surprised at the relief it will afford in all difficult operations. Instead of feeling their way along with perhaps some misgivings as to whether the gold prepared is going to suit the situation all the way through, they feel that they have definite and familiar sizes of gold at hand, at once adaptable to any situation; a view of which is always sufficient to determine the size or form to be taken. The adoption of such a system will be of no small advantage to those writing and speaking upon the subject, in making themselves understood, or in conveying a distinct idea of their plans to their brothers; for it is often the case that the size of the gold is as important as the form. We all perhaps feel how indistinctly our idea of the size of gold used in any given case is conveyed in any form of words used by the profession. We need some system by which an accurate idea of this kind may be easily expressed and generally understood. Then much of the vagueness which hangs around our operations when put in the form of words, would disappear. But such a state of things cannot possibly occur when operators cannot tell in words what size the pieces of gold used in such and such an operation should be. The plan which I have adopted, and which, perhaps, is as simple and as easily understood by all as any other, is that of naming each piece according to the number of grains, or the fraction of a grain contained in a piece. Thus, if a sheet of No. 4 foil be cut into four equal parts, and each part made into a block, they will be called one grain blocks; if it be divided into eight equal parts, they will be half grain pieces. No. 2 gold divided as the last will make one-fourth grain pieces. A sheet of No. 4 gold would make a four grain block or cylinder; a half sheet would make a two grain piece, and so on throughout all sizes that may be wanted. One number of foil is adapted to this system as well as another, and it is applied to all forms of gold alike. This plan presents an unlimited variety of sizes, a very few of which, when properly selected, will be found sufficient for any operation. Any one using any selection of these will understand readily what is meant when any one of them may be mentioned, whether they be sizes he is in the habit of using or not.

I am using half a dozen of these in my office for general use; 1 grain, $\frac{2}{3}$ grain and $\frac{1}{2}$ grain in the form of blocks, and $\frac{1}{3}$, $\frac{1}{8}$ and $\frac{1}{4}$ of a grain in the form of a pellet, and occasionally some of larger or smaller size. But in

whatever form my gold is prepared, it always takes these definite proportions.

I find this system very convenient in directing my assistant in the gold I may want; and, in fact, it is a convenience in every way you may put it.

The preparation of gold I make entirely the work of my assistant. She has her chamois skin gloves and all the necessary instruments in a convenient drawer, and, whatever else goes wrong, every piece of gold that comes to the tray to be used must be just right. And I have no hesitation in saying that it may be done as well, and often better, by a properly instructed assistant, than the operator would do it for himself. And more than this, I have my assistant do all my annealing. For this purpose she is supplied with some annealing forks, which are made by flattening an old excavator, splitting it up with a separating file, and sharpening the points. This will stick into any piece of gold, and hold it without condensing it, and is preferable to the foil pliers in general use. With one of these instruments she takes such a number and form as I may call for, passes it through the alcohol flame, and then into the cavity to be filled, when I take it with my plugger. And while I may be fixing it for the final condensation, she has taken up and annealed another piece, which is held while the first is condensed with the mallet, she always bringing the number called, and annealing lightly or otherwise, as may be directed. The position each should occupy in the cavity is pointed out by a slight motion of the point of the plugger over the spot.

I find this plan to work smoothly and well, and saves much valuable time in the annealing of the gold.

We started out with our gold foil at the time when it was received in good condition from the beater or dealer. We have been with it through that often dangerous interval which has been spent in the gold drawer, awaiting quietly its work of protection to some once beautiful and pearly organ of mastication, undergoing a slow destruction by the unrelenting destroyer. We have kept watch, as well as our feeble powers would admit, for those intruders which might endanger its usefulness, and have done our best to baffle their designs. We have seen the time roll round when it has been called to duty, and have watched anxiously while it has been made to take the forms best adapted to the peculiar duty assigned it, and have at last seen it nestled away solidly and snugly in the home invitingly made for it by the dispossessed monster, DENTAL CARIES.—*Missouri Dental Journal.*

ARTIFICIAL EBONY.

This substance is now being manufactured on a tolerably extensive scale. It is prepared, says a cotemporary, by taking sixty parts of seaweed charcoal, obtained by treating the seaweed for two hours in dilute sulphuric acid. Then drying and grinding it, and adding to it ten parts of liquid glue, five parts of gutta percha, and two and a half parts of India rubber, the last two dissolved in naptha; then adding ten parts of coal tar, five parts of pulverized sulphur, two parts of pulverized alum, and five parts of powdered resin, and treating the mixture to about 300° F. We thus obtain, after the mass has become cold, a material which, in color, hardness and capability of taking a polish, is equal in every respect to ebony, and much cheaper.—*Popular Science Review.*

THE RELATION OF THE OSSEOUS MEDULLA TO THE BLOOD.

The British *Medical Journal*, in abstracting a recent paper by Herr Neumann, in the German *Centralblats*, calls attention to the fact that Neuman's startling theory, that the marrow develops blood cells, has received conformation by the observations of M. Bizzozero. Among other things this observer says, that the condition of the marrow in the bones of hogs in winter, as compared with summer, furnish an important argument in favor of the theory that marrow is a blood gland. In winter, the white corpuscles in the blood of the hog are not half so numerous as they are in summer, and in winter the marrow consists almost entirely of fat cells; whereas, in summer, it contains hardly anything but lymphoid cells. He examined the costal marrow and the spleen in five cases of death from typhoid fever, and observed in both structures an enormous increase of cells containing blood corpuscles.

Sulphurous acid gas, it has been shown by Coiguet, of Paris, will dissolve out the earthy salts of bones more conveniently than hydrochloric acid for the preparation of gelatine.

Prof. Horsford, of Yale College, has shown that fluorine exists with phosphoric acid in human brain.

Prof. Cloxam, of London, asserts that a mixture of tincture of guaiacum, with ozonosed ether, produces, with blood stains, even old ones, a beautiful blue tint.—*London Quarterly Journal of Science.*

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The Fourteenth Annual Session, 1869-'70.

PRELIMINARY LECTURES AND INSTRUCTIONS.—The Dispensary and Laboratory of the College will be opened on the 1st of September, where ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability; and during October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday in November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation, and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

ANATOMY AND SURGERY.

The instruction in this department will embrace a plain and comprehensive view of the structure of the human body. The lectures and the demonstrations will be given over *the dead body dissected for the express purpose* of elucidating the subject. With the same object, vivisections on the lower animals, while under the influence of an Anæsthetic Agent, will be employed. Such description of the comparative anatomy, microscopical structure and connections of the teeth, as their importance may demand, will be fully given. The valuable and extensive collections of Anatomical Preparations of the incumbent of this chair, consisting of wet and dried specimens, papier mache manikins, models in wood, and accurate French plates, will enable him to illustrate his course of lectures very clearly.

In addition to the above course, a Surgical Clinic will be held by Doctor Forbes during every week, for the purpose of performing such operations in oral and general Surgery as may be deemed advisable to advance the student in this particular branch of knowledge. The cases will be selected from a dispensary which the Faculty have established.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical pecularities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

CLINICAL INSTRUCTIONS.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the Demonstrators.

In the Operative Department.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

In the Mechanical Department.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

Practical Anatomy.—The great facilities for the study of practical anatomy to be found in Philadelphia, in several well ordered and supplied dissecting rooms, present to the student advantages for its prosecution superior to those offered in any other city.

Hospital Clinics.—In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of dentistry, the celebrated hospitals and clinics of the city constantly enable the students to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Pennsylvania and Philadelphia Hospitals, two of the largest eleemosynary establishments in the world, are open to medical and dental students, free of charge.

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QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupilage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before

the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

CANDIDATES FOR GRADUATION WHO HAVE NOT ATTENDED LECTURES.—Dentists who have been in continued practice since 1852, are eligible to be candidates for graduation without attendance on lectures. The candidate for graduation must present satisfactory evidence of his having been in practice for the allotted time, also of his good standing in the profession. He must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must present specimens of his workmanship. He must undergo a satisfactory examination by the Faculty, on each of the branches taught by them; when, if qualified, he shall be recommended to the Board of Trustees, and if approved, shall receive the degree of Doctor of Dental Surgery. Of this class of graduates, the matriculation and diploma fees only are required.

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THE

DENTAL TIMES.

VOL. VII. PHILADELPHIA, JANUARY, 1870. No. 3.

Original.

SALIVARY CALCULUS.

BY C. E. FRANCIS, D. D. S.

[Extracts from a paper read before the First District Dental Society, of New York.]

This term is applied to a limy incrustation found attached to the teeth, usually around their necks, but sometimes investing their entire crowns. The salivary glands, like many other glands in the animal system, secrete atoms of lime.

The ducts which convey the saliva into the mouth, carry also their calcareous solutions, which become precipitated, and find lodgment about the teeth where they collect and harden. This concrete matter once fairly attached to a tooth or teeth induces a rapid accumulation of this offensive substance. The broader the bed thus formed, the greater is the inducement for increased deposits.

The inferior incisors, from their peculiar position, are usually the first teeth upon which it collects. The sub-lingual ducts pour their currents against the lingual surfaces of these teeth, and, indeed, they are always submerged in the buccal fluids flowing from all the ducts which empty their contents into the mouth, and which, by the law of gravitation, are invited into the basin beneath the tongue.

The superior molars are next in order of the teeth thus invested; the limy sediment finding its way to their bucco-cervical margins, where oftentimes it collects in large quantities. This may be attributed in part to their close proximity with the ducts of steno, but it seems more reasonable to believe that these surfaces of the molars are so covered by the folds of the cheek that they escape disturbance in masticating, or from the searching efforts of the tooth brush.

Chemical analysis shows that salivary calculus is a combination of lime, salts and animal matter; the ratio of lime depending upon the degree of density in the collection found. The results of analysis differ in different

specimens produced. When very hard it may yield 70 or 80 per cent. of lime. Specimens as analyzed have averaged to 100 parts—about 60 parts phos. of lime, 15 of carb. of lime, 15 to 20 of animal matter and mucus. I have never seen two tables present the same results, so difficult is it to find two specimens of the same density.

The mischief caused by the presence of salivary calculus upon the organs of mastication is almost wholly of a mechanical nature. When suffered to collect in any quantity it causes irritation to the mucous membrane with which it comes in contact. It destroys its connection with the teeth, fairly forcing its way down to the alveolar borders, which upon exposure become absorbed, and the teeth finally loosen and fall out.

I have seen teeth completely incrusted with this calcareous deposit, and have removed large cakes one-sixteenth or one-eighth of an inch in thickness. Often we find the inferior incisors all cemented together so firmly that it seems unsafe to disturb them, on the principal that, by "Union they stand, and if divided they fall." Aside from the mischief produced by the presence of this treacherous deposit, it gives the teeth an unpleasant, aye, a disgusting appearance, suggesting filthiness of person. It contaminates the breath, vitiates the buccal fluids, and hastens the ravages of time upon the whole animal economy.

Common as the cases where it exists, it never need accumulate, and is the result of untidy habits or a neglect to keep the teeth properly cleansed. When it is newly deposited and of a cream-like consistence, it may easily be removed by the skillful use of the tooth brush and some simple dentifrice; but, after it hardens, it can be detached only by steel instruments. There is, however, no necessity for allowing it to accumulate, which, I repeat, is only the result of carelessness.

I find that few persons are willing to admit all this, but frequently attribute the loss of their staggering masticators to medicines which they have swallowed in the course of their lives, and the much abused preparations of "mercury" come in for their share of abuse. "Oh! mercy, what a host of sins are hurled at your metallic head." "If a hundredth part of them are veritable, what a terrible curse you have been to humanity." It seems to be a comforting peculiarity of mankind to shift their burden of sins upon the shoulders of others. Physicians are very good pack-horses on such occasions.

Concrete salivary calculus may be removed by means of instruments made for that especial purpose. They should be of well-tempered steel, of various patterns and sizes, suited to the conditions and positions of the deposits and shape of teeth. Care should be taken to avoid scratching or fracturing the enamel during the process of scaling. After detaching all the particles possible with scrapers, the newly disclosed surfaces may

be rubbed with well-shaped points of "Superior stone," and polished with wedge-shaped sticks of wood loaded with finely ground pumice, soap and prepared chalk.

I have, so far, avoided using the term "tartar," which I consider a misnomer, when applied to salivary calculus; but there is another kind of deposit found upon the teeth, which may more properly be called by that name, in absence of one more appropriate. I refer to the dirty-green or brown stain, so provokingly common in these degenerate times. It usually collects upon the labial surfaces of the incisors and canine teeth, where it stamps a repulsive looking crescent upon each ivory tablet, or completely envelops all the teeth with a dusky veil, forcibly reminding the beholder of an array of miniature tomb-stones covered with mould. This is evidently a secretion from the mucous membrane, exuding from the minute follicles or crypts around the necks of the teeth. After collecting upon the teeth it soon undergoes decomposition, and generates an acid which produces chemical erosion upon the surface of the enamel, frequently eating through to the very substance of the dentine.

The teeth of young persons are particularly liable to be clouded with this slimy deposit, requiring the utmost care to prevent its insinuating and treacherous attachment to their pearly dentures. It is sometimes quite difficult to remove the discoloration thus formed, so deeply has it been instilled into the rods of enamel. It should, nevertheless, be thoroughly cleared away, scraping it off with sharp, keen instruments if necessary. The disturbed surfaces must be smoothly polished, for if left rough they will soon gather another coat of green. Our patients who present such neglected teeth should receive a lecture. They need much lecturing, and oftentimes some scolding. It is the business of the dentist to explain the absolute necessity of keeping the dental organs perfectly free from all extraneous collections, and to instruct them how it may best be done.

New York City.

PROFESSIONAL QUACKERY.

BY SAMUEL WELCHENS, D. D. S.

In locating this term and settling its import and real significance, a wider range of observation should be entertained than is usually devoted to it. It is sometimes applied to the pretensions of individuals through personal or other prejudices, when, perhaps, its true object would be found in the assailant, rather than the one at whom the blow was aimed.

The term quackery is generally applied to false pretensions in the healing art. Dentistry being a branch of this science, it applies as aptly to a bungling operator in that profession as in the medical profession.

But we apprehend that no such limit should be given to a term which expresses so well a meagreness of qualification in any professional pursuit.

Quack teachers, quack statesmen, quack lawyers, and even quack scholars meet us plentifully in every direction, and why not quack dentists, in a profession so easy of access? If a self-styled physician, who has no knowledge of the human system, undertakes to cure all diseases by a sovereign panacea, which is known to himself alone, he is a quack by universal concession.

If a self-styled dentist, though scarcely able to classify the teeth, professes to practice in a profession which treats one of the finest organic structures of the human body, and proves himself a novice and bungler, he should not only be exposed as a quack, but legal enactment, with severe penalties, should be demanded as a protection to the people, as well as to the worthy practitioner in that profession.

Quackery, then, we conceive to consist in a false show of professional ability, or pretension to a virtue or power which is not possessed in fact.

With this definition of the term it will be seen, that failing to meet or reach a proper standard of excellence is not the only touch-stone of professional integrity; but an individual securely planted upon a scientific basis, can justly incur the odium of the term *quack*, by over-reaching, as it were, the limit of his perception and qualification.

Thus, if a given branch of any science is pursued as a specialty, without a proper consideration of relative conditions as balancing elements in the totality of knowledge necessary to proficiency as a skillful devotee of such science, the theme is often run into a ridiculous extreme, and the individual becomes a monomaniac upon the subject. In this way men of the highest culture frequently lose the influence they might exert, by maintaining conclusions not warranted by the facts in the case.

We find this speculative tendency in every profession, and much of it in the pursuit of every branch of science. We would not disparage a spirit of research and earnest inquiry, but the extremes into which minds that are too active are sometimes carried, not only defeats the ends of most brilliant and useful scientific triumphs, but they expose themselves to the ban of the term under consideration.

This kind of quackery is fraught with more mischief than that which marks its footsteps upon every stroke of the instrument, or every feeble sentiment of the mind of an inefficient and bungling operator. It goes abroad into a profession with a certain degree of authority, as being the well digested opinion of those who stand at the very head and front of such profession, and thus, hand in hand, those two extreme representations of the common idea of quackery work out their destiny without the slightest consciousness of their close proximity.

In the profession of dentistry, with its loose code of ethics and easy principles of jurisprudence, any man of ordinary intelligence, with but a smattering of technicalities, and a small stock of mechanical ingenuity, can manage to get a practice, and, through the instrumentality of friends, maintain even a respectable position as a practitioner.

This is done frequently through a species of bombastic advertising, in which everything skillful, scientific and artistic is promised, with no more qualification to back up such pretensions, than they have brains to understand the responsibilities of the profession. Thus some of the unsophisticated are drawn into the meshes of this nicely woven net-work of quackery, to be promised this or that operation free of charge, if they send custom, or influence their friends to patronize and encourage the machine. There is here a support to quackery, through a species of advertising that cannot be met or overcome by any other instrumentality than the strong arm of the law, which would render inefficiency in dentistry amenable, just as the physician, the druggist, or the lawyer is, for mal-practice.

Not content with the measure of mischief they inflict upon a community, where they may hold the sway of "squatter sovereignty" for a season, these "*things*" who arrogate to themselves the appellation of *dentist*, move about from place to place—*itinerate*—grace certain localities with their presence, with a view of benefiting such communities with a dispensation of their superior skill; condescend even to visit houses, so that the dear people be not allowed to suffer too long with maladies which they alone can cure, or munch their food for the want of artificial dentures, such as they "*alone can supply;*" or, we might add, sustain a species of robbery out of natural teeth and money both, *such precisely as they alone can perpetrate.* Now, there is no calculating the amount of just such quackery as this in every community. It steps abroad with the air and strides of a monarch, and what is not made up of unvarnished humbuggery is accomplished by a species of *consummate impudence.*

That this kind of practice should be supported by any class of people is a question beyond our comprehension. How it is that the natural bias of the public mind has a gravitating tendency to deception and humbuggery, rather than a proper appreciation of the noble and scientific, is very hard to explain; but the most perplexing and incomprehensible idea connected with the whole affair is, that so flagrant a species of quackery as that we have just adverted to, should have countenance and support from the great scientific heart of the profession itself.

Publications in the interest of the profession, issued by men of decided talent, and marked skill and ability as practitioners, have not only thrown cold water upon efforts to rid the profession of those mountebanks, but

they actually use sweeping and unwarranted assertions calculated to thwart such efforts to obtain legislation, whereby some headway might be made against this tide of "*professional quackery.*" Not only this, but societies organized for the express purpose of mutual benefit in the theory and practice of dentistry, and the cultivation of closer and more genial social relations are, in turn, discouraged and denounced by them. Might this *veiled palpable defence* of all the corruptions of one of the liberal professions not be regarded as the *very essence of quackery?*

But our strictures upon this subject are not to be confined to those who do not meet in a scientific way the exactions of our art; professional delinquencies and indiscretions in high places come within the sphere of our theme, and must be noticed accordingly. We have no disposition to disparage the inventive talent within our borders, but it very frequently creates an interest upon given subjects, which drives us into straits as practitioners, that lays us right open to the charge of quackery. Here, of course, we resent the adversion, but charge back directly upon those whose high position and earnest recommendations forced the adoption of the article before it could be properly compared and tested by scientific analysis. There is no calculating the amount of trouble the profession has with just such points of difficulty, and it is hard to divest the mind of the idea that that man, however high he may stand in the opinion of others, is a *quack*, if he lends his name or influence indiscriminately to the promotion of a patent article or nostrum which is capable of a false representation, or which may become a burden to his profession.

It is not alone, however, in such recommendations, that many of our substantial men lay themselves open to censure. The extremes to which they are frequently led, in giving opinions upon new steps of advancement in regard to the causes of pathological conditions and therapeutical treatment, make them appear most ridiculous to the sober and thoughtful portion of the profession.

We are always mindful of the power some men have of grasping ideas and suggestions almost intuitively, and the vast advantage their mechanical ingenuity gives them in their manipulations. There is here that peculiar force of character and perception which will at once bring forward talents and genius which leads off in the process of development; but when well.settled principles in our profession are set aside by the assertion that the man is "weak or wicked," or "a sinner," if he observes them, we are tempted to regard that man as a *quack*, however high he may stand in the estimation of himself or his friends. He is emphatically overreaching his own powers of perception, and overlooking the anomaly of his position, when he censures others for doing with an active agent what he himself practices by less potential means. He thus professes to have

the ability to do that which others fail to do, and by virtue of this false show of professional skill, makes "pretensions to an inward virtue or power which is not possessed in fact."

We are not charging quackery upon any individual—we are simply drawing parallels and setting up mirrors, and if any see themselves reflected therein, it is to be hoped that some good may come of it, not only to themselves, but to the profession also. We believe in societies. We think that development by association is to be the future safeguard of our profession; but it must be apparent to the most casual observer that the amazing amount of quackery which is everywhere practiced in dentistry must be eradicated, and that this can only be done with the aid of the *strong arm of the law.*

We have, as a profession, exhausted our efforts to educate the public mind up to an appreciative scientific standard. We have tried the selfish individual plan of every man "going it alone." An harmonious oneness must pervade the entire reliable mass of the profession, if we would divest ourselves of the odium those mountebanks cast upon us, or that which we ourselves may incur by the support we might give it in taking sides against well-directed efforts to obtain legislation upon the subject, or by assuming an inferior omniscient air in our movements as practitioners.

LANCASTER, PA.

"REVIEW."

BY T. L. BUCKINGHAM, D. D. S.

A contributor, who signs himself M. D., in the November number of the *Dental Register*, makes some very pertinent criticisms on the published proceedings of the American Dental Association. But we think in some of his points he is in error, and the object of this article will be to point out some of those errors.

He says: "The American Dental Association is considered in the light of a Supreme Court of Dentistry, in which are tried, by the most rigid scrutiny, all new theories advanced, and all new methods of practice are by it thoroughly investigated, rejecting of the former such as are not supported by facts, and accurately weighing the merits of the latter by the statistics of success and failure. * * * Therefore, while its opinions are entitled to great weight, they are also legitimately open to criticism. From the manner in which the business of the association is conducted, it must be held responsible for every proposition introduced that is received without objection, no matter how erroneous the same may be."

The writer has overlooked the disclaimer that is printed in all the official published proceedings of the association: "The American Dental Association, although formally accepting and publishing the reports of the various standing committees and essays read before the association, holds itself wholly irresponsible for the opinions, theories or criticisms therein contained, except when so decided by special resolution."

It will be seen, by the above, that the association is not responsible for the articles read nor the language used in debate; all the members who attend and take part are not always thoroughly acquainted with the technical terms that should be used. The substance mentioned in the discussion was called by one of the members hydrochlorate of zinc instead of the oxy-chloride of zinc; the object was to ascertain its properties as a capping for nerves and as a temporary filling. The subject was very interesting to most of the members, as they wanted to know the best manner of using it and the success attending its use. To have stopped the speaker then to correct the term would have changed the subject and broke the thread of the discourse; and we doubt very much whether the association would have tolerated such an interruption; and after the debate was over the error was not thought to be of sufficient importance to bring it up, in fact, it was forgotten until it was seen in print, and then, like other errors, was allowed to pass. But our friend has thought it of sufficient importance to make it the subject for the article referred to.

He also says: "There were some very pointed remarks made by an eminent member as to the wonderful ignorance of mankind at large on the subject of chemistry. I do not think that he meant to include himself and fellow-members in that comprehensive term, 'mankind at large;' but their remissness in letting a statement in opposition to generally accepted facts pass unnoticed is open to two explanations, which any person may make for himself."

Now we propose to show that the old adage is correct, "that those who live in glass houses should be careful how they throw stones." When a reviewer attempts to correct an error he should be careful to be correct himself. Let us now examine his explanations and illustrations, and we will italicise the words we want to call attention to.

"Oxy-chloride of zinc is a compound occasionally used for filling teeth, and is made by adding to an oxide of zinc *hydrochloric acid which has been saturated with zinc.*" And further on he says: "This *acid* will not unite with zinc in any form without being decomposed." Then if it is decomposed it is not hydrochloric acid. This error is hardly worth taking notice of.

At the commencement of the next paragraph he writes: "It is a fact in chemistry, that all acids, when not themselves decomposed, *unite only with the oxides of their several bases.*" Now, we know what an oxide is, and many of the oxides are bases, but the oxide of a base is a new term in chemistry. But we will let that pass, as it is not a very grave error. In the next sentence he gives us the composition of some chemical compounds, and makes "use of symbols which all persons at all acquainted with chemistry will understand." Sulphate of soda is written SO_3NaO. Now, it is a rule in writing chemical formulæ to put the electro-positive element or compound first. According to this rule, it should have been written, $NaO\ SO_3$, and it will be found so in all works on chemistry; and yet, through all his article, he has written the electro-negative compound first. In the next illustration he has made a greater error or he has made a discovery; after giving us the action of hydrochloric acid on zinc, which is correct, except in writing, he has reversed the symbols. He says: "But the same decomposition of the acid takes place when the *oxyd* of zinc is used as a base. $HCl+ZnO=ClZnO+H$." Now, can he form the oxy-chloride of zinc by acting on the oxide of zinc with hydrochloric acid? Does chlorine combine directly with the oxide of zinc? Our impression has been that chlorine combined first with the zinc to form chloride of zinc, and that combined with the oxide to form the oxy-chloride; and we think that this is his idea of the composition, for he says, at the close of his article, "as only chloride of zinc is left to unite with the oxyd of zinc it cannot correctly be called a chlorate;" and if we pass on to the next formulæ he gives us, we may see that he has committed another error. The symbols for hydrochlorate of ammonia he gives are, $HCl+AmO=HClAmO$. Now, Am is not properly a chemical formula, although it is used in some of the books. But we suppose he intends it to represent ammonia, or NH_3. If he will refer to the books he will find that hydrochlorate of ammonia, muriate of ammonia, sal ammoniac, or chloride of ammonium, (for it goes by all these names,) is composed of $AmHCl$, or NH_3HCl, or by the more recent formula, NH_4Cl, and there is not an atom of oxygen in it. There are other errors in the article, but it is not necessary to pursue the subject further. Our object was not so much to criticise the article referred to, but to direct the attention of readers to the science of chemistry. Many complain because they are not able to read chemical books with the same satisfaction they can books on other subjects, and the difficulty arises from not understanding the nomenclature. When a few pages of these works are studied we have the key to the science, and we can understand, by a correctly written chemical formula, the composition of a compound much better than we could if it were written out in the most extensive form.

FUNGOUS GROWTH—PERIODONTITIS.

BY J. FRED. BABCOCK, BANGOR, MAINE.

Early last spring a case of morbid growth, in the mouth of a lady, was presented to me for treatment, which, upon examination, I found to consist of a large amount of fungous gum situated in the superior jaw, where it was so extensive as to cover the whole of the buccal (as applied to teeth) and labial surfaces of the gums; the teeth were absent in the superior jaw, and the teeth and gums were perfectly healthy in the inferior maxillary. The appearance of the fungous growth, when the upper lip was raised, was that of a double lip, of structure thick and dense, having the same appearance that it might be supposed to possess had the artificial plate, which she had been wearing, been constructed sufficiently large to inclose a portion of the upper lip and cheek on its inner surface. Upon inquiry, she informed me that it had been accumulating for the past three years, the length of time she had been wearing her artificial set; but for some time previous to calling upon me she had been obliged to discard them entirely, because that the growth, so to speak, had crowded them out, and she now desired to have her mouth restored to its normal condition *without* the aid of the knife. Seeking for the cause of this morbid production, I was shown a set of teeth attached to a silver plate, and in this plate it was instantly evident that I had found the object of my search; for that portion lapping over the alveolar ridge on the labial and buccal surfaces had been constructed extravagantly high, and with its sharp, blade-like edge, had cut deep into the lip and cheek, causing congestion and inflammation of the circulatory vessels, followed by effusions which, subsequently organizing, formed the morbid production mentioned.

Upon consultation (by letter, in which I fully described the case) with Prof. George T. Barker, of Philadelphia, as to the probabilities of success in attempting to absorb so large an amount of tissue with the officinal tincture of iodine, he advised me to try an etherial tincture, the formula for which may be found in an article written by him, entitled "Uses of Iodine Preparations in Dentistry," and published in the May number, 1869, of the "Dental Cosmos." I acted upon this advice, and at the end of two months, after having, with a camel's-hair pencil, freely painted the parts twice each day, (carefully drying and protecting the healthy tissue with bibulous paper each time,) it was reduced to nearly one-third of its original proportions. About this time some of the characteristic symptoms of iodism (which follows the long continued application of iodine,) becoming apparent, viz: nausea, irritation of the lining membrane of the trachea, causing a hacking cough and restlessness at night, I judged that these symptoms had perhaps been hastened by the inhalation of the

ether vapor, surcharged as it was with iodine, and for some two weeks I abandoned it for a saturated solution of iodine and creasote, but this had no effect whatever in further reducing the growth, and meanwhile the disagreeable symptoms, before mentioned, having entirely disappeared, I returned to the etherial tincture and without any further impediment, another four weeks found it almost entirely reduced, with the exception of one or two still hanging portions near the condyles of the jaw where the medicine had not been applied, because of the great difficulty in reaching them properly; these were excised with a sharp pair of surgeons' scissors, and in another week I had made her a new set of teeth upon a rubber plate, which I was recently pleased to learn had given entire satisfaction, and upon examination of her mouth could find no trace whatever of that which, but a few months before, had made her face so unsightly and thoroughly unnatural.

Case Second.—A lady called at my office, during the past summer, very anxious to have me go and see her sister, who, she informed me, had been confined to her bed for the past four days, suffering with an exceedingly severe toothache. This was upon Friday forenoon, and upon inquiry I learned from this lady that her sister had experienced the first attack upon the previous Tuesday. On the following day she was taken to a dentist for the purpose of having the operation of extraction performed. He, however, said he could not find any apparent cause for the pain; but, probably acting upon the principle that, "nothing venture, nothing gain," he proceeded to extract the second bicuspid tooth, which had been previously filled with amalgam, but which, since the operation of filling, over a year before, had given her no pain. Owing to the loss of blood consequent upon the operation of extraction, she experienced complete relief for about an hour, when the pain again returned even more severely than before, and she again had recourse to this dentist, who, upon responding to her call, informed her that he could only afford relief through the extraction of all of her upper teeth. To this proposition she would not consent, when he endeavored to quiet her with chloroform, and also with morphine, but without success. At this stage I was called in, and upon reaching her bedside found her very pale, her left eye very badly inflamed, and already much emaciated with the intensity of her sufferings for the past three days. She was moaning piteously, and with an occasional shriek, as a spasm of pain would traverse the nerves in the side of her face, would beg to be relieved from her misery. For ninety-six hours she had not obtained sleep, and could only secure temporary relief through taking ice water into the mouth and instantly spitting it out again, then immediately repeating the operation. This she was obliged to do so often, that in the course of twenty-four

hours she would, in emptying the water from her mouth, fill an ordinary wash bowl some five or six times; in fact, so often was she obliged to sip the water that it was with the greatest difficulty that I could make an examination of her teeth; but, after some perseverance, I partially succeeded, and upon concussion with an instrument I found four teeth, the periosteum upon the roots of which were highly inflamed, viz: the canine, first bicuspid, and the first and second molars, (the second bicuspid gone,) all upon the left side of the median line. These teeth, with the exception of the canine, which was filled with gold, were filled with amalgam. I endeavored to make local treatment, but found it to be utterly impracticable, owing to the fact that the constant severity of the pain made it imperative that she should have the ice water in her mouth continually. Finding it impossible to resort to the usual measures, I gave her a teaspoonful of the following prescription:

℞.—Quinine, sulph., ʒss;
Acid, sulph. aro., ʒij;
Elix. calisaya bark, ʒxiv.—*Mix.*

When almost instantly the pain ceased, and for some three minutes she experienced entire relief; whereas, before it had been *unremitting*. At the end of this time it returned, but with abated force, and before I left her, which was in the course of an hour, the paroxysms were very much less frequent, (this was at 12 o'clock, M.) I left the medicine, with orders that the dose be repeated at 2 o'clock, P. M., and upon returning, at 3 o'clock, I found her comparatively comfortable, but having an occasional twinge of pain about once every fifteen minutes. The water had been entirely discarded, and her gratitude to me for what relief I had afforded was very marked. Morphine powders were left for her to take, and upon calling the next day I found that she had slept soundly, and since the night before had had scarcely any pain. I now made a more satisfactory examination; the teeth were still quite sore, and no reason was found to change my previous diagnosis. Upon the day following she was brought to my office, when I applied three leeches to the gum, distributed directly over the teeth affected, and made a free application into the wounds of tinct. of capsicum; this treatment was again repeated in about six hours, only that, instead of leeching, the lance was used freely. It was repeated the following day, when I pronounced my patient cured; for all pain had ceased, and the teeth were not more than ordinarily sensitive to the quite heavy concussion of the large end of a plugger. This was six months ago, and quite recently I have learned, by personal inquiry, that the lady has not been afflicted since. It only remains for me to add that I could not trace this inflammation of the peridental membrane to any apparent cause; but it was probably the result of a very severe cold which she had but recently acquired.

OXYCHLORIDE OF ZINC AS A CAPPING.

BY J. S. SMITH, D. D. S.

Since reading the report of Dr. Salmon, of Boston, (which, by the way, I find to be very instructive,) upon the subject of the application of oxychloride of zinc to exposed pulps; and, also, an article written by Dr. James Truman, DENTAL TIMES, Vol. VI., July, 1868, I have been experimenting, to some extent, with this agent, as a capping, with varied success. I might say of all cases treated in this way by me, two-thirds of the number have been successful so far, to the best of my knowledge. The failures may be attributed to the lack of sufficient patience upon the part of the patient, through a dread of again being compelled to have the case treated, or the tooth removed.

The pulp, and the parts about the tooth or teeth, should be in a healthy condition before capping. In my judgment a bleeding pulp should be gently syringed with tepid water, and the hemorrhage should subside prior to the application of the cap, else the coagulated blood would increase the bulk under the filling and upon the pulp, causing undue pressure upon that organ; consequently, pain follows, and a probable necessity to destroy its vitality. The pain, however, may subside for a time from pressure, which of itself, in many instances, would not be sufficient to endanger the vitality of the pulp; but the gas that may be generated from the coagulated body may set up an irritation in time. Thus, the pulp may be said to be in danger from both; pressure upon the one hand, causing inflammation and suppuration, and gas generated, causing irritation and finally abscess.

This, I am aware, is but theorizing on my part. If I have strayed into error, I await patiently for some one interested to let his light shine through the medium of this Journal for the benefit of those who are laboring in the same common cause. "It is certainly desirable always to save a part where it is possible so to do," says an eminent operative dentist and professor. Oh, if the profession had more of that mind and ambition of making efforts to investigate that we may learn to save, as well as destroy, the organs that are entrusted to our care.

The dental surgeon should be as conscientious upon this point as the general surgeon is supposed to be in saving the arm or the leg when diseased.

The further we can advance in the healing art of dentistry, the higher we are elevated as scientific men. And I trust the day is not very far distant when the profession, or the specialty of *dentistry*, will stand shoulder to shoulder with general medicine, and other specialties, and be respected as such by the world.

COLUMBIA, PENNA.

CASE OF SECONDARY OSSIFIC DEPOSITION IN A TOOTH.

BY S. P. CUTLER, M. D., D. D. S.

A lady about forty-eight years of age, rather stout, generally healthy, and of a lymphatic, nervous temperament, some tendency to the sanguine, presented herself for dental treatment. Her teeth had from early childhood been defective, and for the past ten years she had been wearing a gold plate clasped to two molars, resting upon the roots of the incisor teeth, which had been filled. The left central incisor had been intact, except that some twenty years ago it had been filled on both approximal surfaces with gold, and upon its lingual surface, at a later date, with os-artificial, which had failed to preserve the tooth. A few days before presenting herself this tooth was fractured in a line with the three cavities of decay. On examination, the remaining portion was found quite sound and firm, and I excised and filed the tooth to the gum before reaching any sensitive point; there the pain became very severe, but still there was no exposure of pulp cavity. After filling the cavity in the root sufficiently, a tooth was added to the gold plate, which rested on this stump. The operation being satisfactory, she departed, but in a few days returned, and stated that the root last treated was sensitive to sweets, acids and cold water, also to the pressure of the plate in mastication. I applied nitrate of silver to the exposed bony portion of the root, which gave momentary pain, soon subsiding. The point to which I wish to direct attention is this, the left central incisor ossified in the crown, and in the neck some distance above where I filed, the ossification being complete, uniform and homogeneous, though with a magnifier was unable to determine the original outlines of the pulp cavity, which can generally be done, the secondary bone being distinctly marked, this case forming an exception to this rule.

We often see teeth calcify inward from wearing away by mastication and other causes, which, however, are more rarely met with. This case, though not having caused any trouble, must be regarded as pathological, not physiological, though a saving proviso in this case as in abraded teeth. There must have been sufficient irritation by the presence of the plate on adjoining stumps, and the amount of decay and filling, to have induced the calcification. Whether or not the pulp itself first became nodular, and then ossification of the inner walls took place as a secondary process, I cannot determine, having no data to go upon. If nodulation took place at all, it certainly must have been in the fang portion, entirely above the point filed, otherwise there would not have been the same homogenity in the adventitious process. I had before many times found crowns of decayed teeth, where removed for the purpose of inserting pivot teeth, more or less calcified, but none so high up the neck. In some instances

it is found very near to the gums, but have not, in years past, paid the same attention to such phenomena as more recently. Here, then, is a new field of research that will help out our brethren from former ignorance of the subject to more definite and refined knowledge in this new and comparatively untrodden pathway to special and important knowledge. That nature does make these efforts, in rare instances, to save herself from ruin, there can be now no longer any doubt on the subject. That this is also a provision that nature makes to save her tooth we may readily infer; still, on the other hand, this might be regarded as an exception to her wonted rule, and not the rule itself.

I recently prepared a specimen from a tooth that had both nodular and calcified pulp walls, a lower molar, the greatest amount of secondary deposit being at the neck region, immediately over the bifurcation, making one of the most interesting specimens for the microscope I have ever seen, fully establishing my former views on the subject of dental anatomy, especially histologically.

We want further researches into dental phenomena; then let every one in the profession contribute but his share, and we will soon be far in advance of our present stand-point of dental knowledge and usefulness, commanding more respect from our more proud *padre, medicine.*

As to how long the root above spoken of may retain its vitality by its living pulp it is impossible to determine, as we have no data to predicate from, there being a want of published observations on the subject.

This root may or may not continue to calcify and retain vitality; the chances are favorable, at least, for an indefinite vital continuance. The falling down of the fang, thereby cutting off and curtailing the extent of tubular structure, may and doubtless will shorten its vital existence by narrowing down and circumscribing its boundaries. I intend watching closely the result of the above cited case.

Holly Springs, Miss.

DISPLACEMENT OF A TOOTH GERM BY A BLOW.

BY M. MILNOR WORRALL.

Miss D—, a maiden lady, about forty-five or fifty years of age, came to my preceptor's office about the middle of October, complaining of a soreness at the roof of her mouth.

She was wearing at the time a full upper set of artificial teeth on vulcanite, which, upon being taken out of the mouth, showed quite a discoloration on the palatine surface. Upon examination of the mouth, there was to be seen on the palate, a little to the right of the median line, what appeared to be a piece of bone about the size of a pin-head.

My preceptor, after a careful examination with an excavator, asked her if she had ever had an accident occur to her teeth in childhood. The answer was in the affirmative, viz: That, when about seven or eight years old, she had a fall down stairs, by which her upper front teeth (superior incisors) were knocked out, and that afterward she never had the tooth on the right side, next to the two front ones, (the right, superior lateral incisor.) Upon hearing this, his mind was soon made up that this was the missing tooth, the germ of which had been displaced by the blow on the temporary teeth. He then, with a lance, made two incisions, one at right angles with the other, across the tooth, to see in what position it was lying. He found that, after extending upward a short distance, the root turned upon itself at right angles, the crown pointing toward the posterior portion of the mouth.

After the bleeding had in a measure subsided, gas was administered and the tooth extracted. On examination out of the mouth, it was found that the crown had been absorbed, leaving nothing but the neck and root of the tooth. She was first troubled with pain about six months before, and the pressure of the tooth, upon her artificial plate, had been a constant source of irritation.

West Chester, Pa.

"SUBJECT."

"Doctor, I once had a tooth extracted that was so difficult of removal that the operator actually raised me bodily from the chair, in his efforts to get it out."

The above sentence is doubtless familiar to nearly all dental practitioners, and the thought occurred to me, that had I the brains and power of humorism of a Charles Dickens, what an opportunity would a scene like the above present to the mind of such a genius. The scene of poor Pickwick, waking to consciousness in the pig stye, would fall short in humorousness, if compared to the scene of an operator grasping a tooth with such a degree of firmness and strength as to elevate his patient bodily from the chair.

Just pause for a few moments, and take into consideration the general appearance of such an affair. The patient is suspended, as it were, in mid air, by the grasp of an herculean arm attached to a tooth; as is usual, under such *extraordinary* circumstances, the patient must naturally be suffering excruciating pain, which, in answer, produces great and involuntary contractions of the entire muscular system, thereby presenting to view a similar appearance to that of holding a dancing jack by the head, and pulling the string to make its limbs fly about; now, add to this picture the peculiarities of expression in the face when incited by intense fright,

with hair standing on end, eyes ready to leap from their sockets, mouth distended, and elevated eye-brows, &c , &c., and you will have a scene worthy the notice of any humorist.

My reader, the above little sketch is not altogether mere fancy and fun, but, as the old and well worn adage remarks, "that truth is stranger than fiction," I must concur in its applicability to this subject. When we take a retrospective view of this operation, regarding the positions assumed, and instruments used in extracting teeth, it is not surprising that such scenes have been enacted in actual practice; and I regret to add, even in this enlightened age, does occasionally continue to occur. Indeed, I have personally witnessed some operations by unskillful manipulators that were sufficient to startle the most petrified of human hearts.

But thanks to an all-wise and merciful Providence, we are emerging, as it were, from a period of darkness, ignorance and barbarity, and are being ushered into a land full of promise and humanity. A patient once remarked to me, after an operation, "doctor, this advance in science is perfectly wonderful, and only corroborates my *religious* belief, that in time to come, on *this* earth, we will have done with all physical pains and sufferings." Certainly this is an humane religion, and, as we are subjects of an humane omnipotence, why not entertain such theories?

But I am digressing, and would beg leave to offer a suggestion to practitioners, who have thus ingloriously succeeded in proving the difficult nature of an operation, by the accompanying elevation of their patients to reflect a little while, and employ (providing they do not possess it) a little *common sense*, and take into consideration two or three questions: first, whether it is the difficult nature of the extraction; second, the instruments he is using; or thirdly, the position in which he may stand to his patient, that could be productive of such a result. It appears to me that, with a very few moments of deliberation, he will be able to answer intelligently and emphatically, that it is the instruments employed and the position assumed, and not the natural difficulties attending a severe case of extracting.

Perhaps some of my readers will think a statement had better be made regarding the proper position of the operator, and what sort of instruments, in the author's opinion, are the most desirable in this particular operation. This, he will have to answer, is a matter of fancy, some preferring certain peculiar instruments and positions, and others choosing quite a different form; but his own choice of position is *always* to the right of the patient, and to employ only such instruments as will allow perfect working harmony with this position; this gives the operator the entire control of his left arm to embrace and steady the head while he is manipulating, rendering

it impossible to move his patient, besides giving additional force and power to his right arm, by its being braced firmly against his breast.

This little publication is not meant for a severe criticism, but to exhibit to such persons who are not familiar with a legitimate "modus operandi," that there are no cases of extracting teeth of so difficult a nature as to justify the sentiment of this article. F. R. T.

ON TAKING IMPRESSIONS FOR OBTURATORS.

BY GEO. T. BARKER, D. D. S.

To obtain an accurate impression of a mouth, in which there exists a cleft or opening through the hard palate alone, or both the hard and soft palate, has ever been considered a difficult operation, one requiring delicacy of manipulation and the display of considerable tact to accomplish a satisfactory result. Congenital clefts of the palate are of four varieties. One, the most common, may be described as a cleft commencing anteriorly near the median line, at the lip, by a division, constituting hare lip, extending through the alveolar walls, and the hard and soft palate.

There is usually but slight separation of the sides, as it passes through the alveolar processes, but the lesion becomes greater as it extends backward through the hard, widening still more in the soft palate. One of the second class may be described as consisting of a cleft, commencing at the base of the alveolar process, extending backward, with loss of substance and gradual separation of sides, through the hard and soft palate.

The third class is characterized by a cleft extending only through the soft palate, generally with considerable loss of substance, and ending abruptly at the hard palate. In some few instances the cleft extends a short distance into the osseous structures of the hard palate.

The fourth class, which is most rare, consists of a simple slit, without any absence of tissue, extending through the velum pendulum palati. This class is well adapted for the operation of staphyloraphy, which may be described as a simple paring of the edges, the parts being held together until united by adhesion, by sutures or ligatures. In the first three classes there is usually more or less deformity of the dental arch, the concavity of the roof of the mouth is greater than usual, and some of the incisor teeth are either absent entirely, or give marked evidence by pitting and abnormal form of impeded nutrition.

In these classes there is usually, on the part of the sufferer, inability to articulate words properly, more or less difficulty in masticating food, and swallowing liquids, which, in spite of efforts to the contrary, will pass into the nares. This is not always the case, for we not unfrequently see

persons suffering with these lesions, even of the first class, who have no difficulty in masticating food or swallowing liquids, they having, by practice, attained the power to close the anterior portion of the cleft by the tongue, which is made to act the part of an obturator. This provision of nature, to overcome the defect of structure, is seen with infants suffering from congenital clefts; for, instead of taking the nipple of the breast between the upper gum and tongue, as ordinary, it is taken between the lower gum and tongue, pressure being made by that organ at the same time it is used to close the cleft. In this way is the operation of nursing performed.

In almost all classes of cases presented for dental treatment, there is usually considerable inability to articulate words with distinctness, those only having nasal sounds being understood by persons whom they are addressing, unless they have, by constant communication, become accustomed to the peculiarities of expression, and can thus guess at their meaning.

On this subject, Mr. Stearns, of London, author of "Treatise on Congenital Fissures of Palate," says: that perforation or fissure of the palate may render the articulation of some of the letters impossible, and, at the same time, vitiate the character of all the others. The indistinctness of utterance is usually proportioned to the extent of the lesion; thus, when the fissure extends as far as the alveolar processes, the patient loses several of the letters, which another, with only a portion of the soft palate involved, is able to produce with considerable distinctness. In cases of fissure, particularly those of the more extensive kind, the movements of the tongue are comparatively limited, as the patient is instinctively aware that the very effort he should make, in order to give letters their appropriate articulation, often serves to render the impediment more painful. So far, indeed, is this inactivity of the organs sometimes persisted in, that speech becomes little else than the emission of a succession of vowel sounds, which, in lieu of receiving proper consonant adjuncts, are only made intelligible by the accompanying inflection, key, gesticulation and expression of countenance, all of which are, more or less, the vehicles of thought. With the limited action of the tongue, nearly all the muscles concerned in the formation of articulate sounds, in a greater or less degree, participate, while the muscles about the nose, as the compressor nasi, depressor nasi, are violently contracted for the purpose of closing the nostrils and preventing the escape of the sound. This gives a particularly unpleasant aspect to the features.

If the velum and uvula be defective or wanting, deglutition is exceedingly difficult, as the aliment matters, instead of passing comfortably along the pharynx, are, to a greater or less degree, forced into the posterior nares.

This is the case whether the lesion be congenital or accidental; sometimes deglutition can only be effected by throwing back the head as far as possible, and casting the food into the pharynx. The inconvenience of incomplete or difficult mastication and deglutition is as serious as that of imperfect speech.

To overcome these defects, and enable speech and mastication to be properly performed, dentists are called upon to furnish some mechanical appliance. I will not, in this communication, speak of the kind of obturators that may be made use of, but will do so in the next number of this journal. Having decided to make an obturator, and believing that the patient can be benefited by one properly manufactured and adjusted, it becomes necessary to obtain a correct impression. To do this, and I will take one of the first class, it has been recommended that the superior portion of the clefts, that is, the parts represented by rudimentary nasal floor and sides, and remaining portions of soft palate, should be obtained by means of sectional plaster impressions. This was exceedingly difficult, and few succeeded in obtaining perfect sectional impressions. It was also requisite that they should be replaced in the superior part of the cleft, their under surface oiled or brushed with a solution of a soap, so as to obtain, while they were in position, an impression of the inferior part of the cleft, as well as an impression of the roof of the mouth and the dental arch. Many, before attempting to take impressions, form impression cups, modeled from rough wax impressions, which, to some extent, facilitate the obtaining of a good impression. A much better method was suggested by Dr. Harroun, of Toledo, who used to obtain an impression of the superior portion of the cleft, a simple piece of gutta percha, cut somewhat of the size of the cavity, to which was attached a piece of watch spring, and covered, (the gutta percha,) above and below, with plaster of Paris. The apparatus was carried well backward into the pharynx; was then brought forwards, behind the rudimentary portions of the soft palate, and, by means of the watch spring, was drawn into position upon the nasal floor, thus obtaining a perfect impression of the cavity. The under surface was then oiled, and an impression taken with a common cup of the roof of the mouth, with the cleft closed by the first impression.

The watch spring was allowed to pass through a hole in the cup at the time of its insertion into the mouth. In many cases the two impressions could be carried backward into the pharynx, and could be removed together; but, by the exercise of a little skill, they could, if necessary, be readily separated. The disadvantages of this apparatus was due to the fact that overhanging portions of the superior impression were apt to be broken from the impression, and their re-adjustment was difficult and

sometimes impossible. Believing that some other substance would accomplish a better result than gutta percha, I have recently used, in the superior cleft, a piece of fine sponge, cut somewhat the shape of the nasal cavity, and thoroughly saturated with plaster of Paris. It is introduced in the same manner as the "umbrella," of Dr. Harroun, and has this advantage: The sponge swells in the cavity, and takes a perfect impression of the parts. If any fracture occurs in withdrawing the impression, the meshes of the sponge hold the pieces so they can readily be placed in position. The inferior cleft, dental arch and roof of the mouth may be taken with an ordinary cup, as already described.

Occasionally persons are met with whose palate is so sensitive to the presence of a foreign substance, that it is impossible to obtain an impression of the parts desired, as vomiting and retching occurs whenever any attempt is made. All such persons should undergo a preparatory course of treatment before the attempt is made to obtain an impression. It consists in simply passing, several times a day, the bowl of a spoon over the rudimentary soft and hard palate, and antero-posterior wall of the pharynx. This course, if persisted in a few days, will enable the person to allow an impression of the mouth to be taken without difficulty.

(To be continued.)

DENTAL CLINICS.

BY ELIHU R. PETTIT, D. D. S.

There are many dentists throughout the country who have never visited a Dental College, and who have very erroneous ideas, not only in reference to the workings of such a college in general, but especially of the manner in which a dental clinic is conducted. I therefore propose, as briefly as possible, to give them some account of the clinic of Operative Dentistry, as conducted in the Pennsylvania College of Dental Surgery.

Our operating room, or clinic room as it is usually called, is a well-lighted room, 100 feet long by 20 feet wide, furnished with twenty-eight operating chairs, so arranged as to command the best light. Two of these chairs are reserved for the extraction of teeth exclusively, while the remainder are occupied by patients who desire to have their teeth filled or diseases of the mouth treated. The number of patients presenting themselves for treatment is so great, that it is very common for all of these chairs to be occupied by them at the same time.

The clinic room is also well supplied with forceps, elevators, &c., sufficient for the performance of the most difficult operations, and with all the medicines, &c., usually employed for the treatment of the various dis-

eases of the mouth. The students are divided into classes, and assigned to the chairs in regular order, and are expected to treat the mouth and teeth of the patients assigned to them by the Demonstrator, restoring them to a healthy condition.

It is a common practice, especially in the country towns, for dentists to take pupils into their office for a year only, before sending them out to practice dentistry on their own account. This time is generally spent in the laboratory, as it is very seldom that a preceptor will permit his pupils to operate upon his patients; so that about the only practical knowledge they get of the very difficult operation of filling teeth is by looking on occasionally while their preceptor performs the operation, and by filling a few teeth out of the mouth. With this little experience they "set up for themselves" at the close of their year of pupilage, and failure is a very natural result of their first attempts to fill difficult cavities in the mouth. What then? Not being able to insert a gold filling they resort to amalgam, which they find works very easily and nicely. Is it at all surprising that these dentists soon get into the habit of using amalgam in all cavities except the most simple? or that there is, as has been stated, more than a ton of amalgam used every year in filling teeth in the United States alone?

But how is it with those students who attend the Dental College? In the clinics they not only have the privilege of looking on while others operate, but they, themselves, are immediately set to work, under the supervision of the Demonstrator, upon simple cavities at first, and gradually proceeding to those of great difficulty. In this way they not only learn how to fill teeth properly, but they also gain that confidence in themselves and in their work which is so necessary to success in life. Nor is this all. By association with others, pursuing the same course of instruction, and by seeing the result of the labors of those who are in advance of them, a spirit of emulation springs up in them, so that they make greater effort to equal or excel the operations of others than they would did not this spirit of rivalry exist.

By reference to the appended report of the amount of work done in the clinic up to the 1st of January, 1870, (about one-half the session,) some idea may be formed of the immense advantages the clinic affords to those who seek its benefits. It is hardly necessary to say that all of this work is performed by the students, many of whom, except for the opportunity afforded them by the dental clinic, would obtain no practical experience in filling teeth, or treating diseases of the mouth, until they enter upon the practice of dentistry on their own account. This work will compare favorably with the operations performed in private practice. Indeed, it is not too much to say, that some of the fillings inserted by

the students in our clinic *cannot be excelled.* Of course, this refers particularly to the work of the second course students, as, among those of the first course, there are many who had never attempted to fill a tooth before they came here. But, with the advantages they here possess, the rapidity of their progress is often surprising.

The clinic is under the supervision of a Demonstrator, who is constantly passing from chair to chair, rendering necessary assistance, or giving information in reference to peculiar cases that may present.

Many suppose that the patients who present themselves at our clinic belong to the very lowest class of society. This is not the case. It is true, we have many from that class who come for the purpose of having teeth extracted, as they usually allow caries to progress until the teeth cannot be saved, or they do not appreciate the value of their teeth, and cannot be persuaded to submit to the long and tedious operation of having their teeth filled. Our patients generally are respectable persons who are in reduced circumstances, or those who are engaged in some employment, the remuneration from which is not sufficient to enable them to pay a large bill for dental work. The work performed in the clinic is, of course, entirely free of charge; hence, our institution is the means of doing an incalculable amount of good, and of relieving much suffering.

In conclusion, a cordial invitation is extended, to all who feel interested, to visit the College, and to examine for themselves the workings of the institution.

The following is a report of the work performed in the Operative Department up to the first of the present year. The session will close on the 1st of March, and the next number of the "TIMES" will contain a complete report for the session, both of the Operative and Mechanical Departments.

Number of patients visiting the clinic,	2092
Gold fillings,	556
Tin fillings,	346
Amalgam fillings,	24
Hill's stopping,	57
Oxy-chloride of zinc,	49
Treatment of pulp,	183
Superficial caries removed,	32
Treatment of periostitis,	22
Treatment of alveolar abscess,	34
Treatment of inflammation of gums,	16
Treatment of partial necrosis,	3
Removal of salivary calculi,	117
Extraction of teeth and roots,	2547

Dental Associations.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a monthly meeting of the Association, held Sept. 9, 1869, the subject of *oxychloride* of zinc was taken up for consideration.

Dr. BUCKINGHAM gave a condensed statement of the discussions had upon this subject at the Annual Meeting of the American Dental Association, held at Saratoga, in August.

Dr. J. TRUMAN'S use of this material was entirely experimental. The success that had followed justified its continued use. So far he had but few failures, and these did not involve the destruction of the pulp. They were confined to those cases where the pulp would not tolerate the presence of the oxychloride without severe and continuous pain. In his judgment it will require years before any positive opinions, for or against, can be given in regard to its value as a material for capping.

Dr. GITHENS had used oxychloride of zinc for capping, and with some degree of success. For sensitive dentine, he had found it very valuable.

Dr. WERT thought this material was undergoing the same experience as amalgam. At one time wholly condemned as unfit for use, and then taken up and almost universally used. He had abandoned it as worthless for filling teeth, but since he had heard such favorable reports at Saratoga, he felt in duty bound to try it again. The subject was then continued for further discussion at a future meeting.

Dr. GITHENS presented a valuable specimen of four central incisors, the central and lateral of each side united. He had inserted a silver pivot, in amalgam, fifteen years previously. Recently, the tooth was thrown out of the mouth by an accident, and on examination, the silver pivot was found still firmly imbedded in the root.

Dr. WERT had succeeded in reimplanting teeth in a person of twenty-two years, and desired the opinion of members present on the policy of this operation.

Dr. BUCKINGHAM doubted whether it was possible for the nerve, once severed, ever to reunite. A tooth may be dead and still retain its color.

Dr. W. H. TRUEMAN doubted the correctness of the theory upon which this operation was based, as in plastic operations the union must be kept up to insure success.

Dr. JAS. TRUMAN said that this operation was a very old one, it being a favorite with the celebrated Hunter. Dr. A. Mitscherlich, of Berlin, had given a very full report of his work in this direction. The success he and others had met with, warranted us in performing it when needed.

OCTOBER 19, 1869.

The subject of oxychloride of zinc, continued from the last meeting, was taken up for consideration.

Dr. BUCKINGHAM had made some experiments, but they were not as yet satisfactory to himself. He could not determine its solubility in water, there being no test for moisture. Some absolutely washes out, owing, probably, to the condition of the saliva. It is soluble in acids. The greater amount of acid the more solution. It absorbs large quantities of moisture. He used it for sensitive dentine, and fills pulp canals by placing it on the first piece of gold. It is mixed somewhat thicker than cream. In its antiseptic property it is fully equal to creasote. He had had some trouble in using it as a capping for nerves, and instanced a case where pain continued from eight to ten hours, and after extraction of the tooth found the pulp decomposed. He thought it was possible for oxychloride of zinc to preserve the pulp for years, and then, when its antiseptic properties have been lost, decomposition may ensue.

Dr. C. N. PEIRCE had not been a strenuous advocate for capping nerves. He thought a tooth with a live pulp of more value than a dead one. He had removed fillings of oxychloride of zinc, and found them in good condition. He had filled a number of teeth with it the past three months, and all as yet comfortable. In one of these there was a slight fungus growth of the pulp. He applied tissue paper, saturated with creasote, over the pulp previous to applying the cap. The patient had complained of shooting pains at a recent examination of one of these. He felt satisfied that the pulp was in process of destruction in this tooth. His success with paper, saturated with creasote, had been quite as good as with oxychloride. He was in favor of capping, if a reasonable hope existed of saving the tooth by that means, as the difficulties were many in filling roots. In the pulp canals he considered its use far preferable to creasote; owing to its antiseptic properties, it would produce equally good results. For capping purposes he did not think oxychloride possessed any virtues over many other things. He reviewed the history of the operation of capping in its various forms. The apparent success in these made him cautious in regard to this capping. This material he deemed very valuable for use in those thin shells of teeth that would not bear any other kind. He had made some experiments in combining this material with metal filings, and also with amalgam, but was not prepared to give an opinion upon it, further than that the combination made much more solid fillings than oxychloride alone. After a test of several months no change had been manifest in those inserted. He exhibited several teeth filled in this way. Gold filings combined with oxychloride, the latter

combined with amalgam; with the amalgam, mercury was used in the usual way.

Dr. BUCKINGHAM had used oxychloride to advantage in teeth to be filled with amalgam. He pressed the oxychloride against the walls to prevent the amalgam from coming in contact with them. He also used it in front teeth with thin walls. He had not seen the teeth treated in this way since, and could not report results.

Dr. J. TRUMAN'S experience in this mode of practice had now extended over two years, and during the last year he had almost exclusively confined the treatment of exposed pulps to the process of capping with this material. From his observations, success depended, to a large extent, on the condition of the pulp at the time the application was made. Where there has been a congested state of the pulp previously, the pain will be much increased. In one recent case, so excruciating had this been, that he was obliged to remove and destroy the pulp in the usual manner. The best results had followed the capping of pulps recently exposed, and where no pain had previously been experienced. He had examined a number of cases where the oxychloride had been in from two to four weeks, and, with one exception, had found the pulps alive. In those cases, where most pain resulted, there was apparently no loss of vitality in the pulp. So satisfactory had been the results, that he felt satisfied to continue and wait the only true test, that of time. One filling that he had constantly under observation, had now been in ten months. The pulp was fully exposed at the time the cap was placed. The tooth remains in a perfectly comfortable condition, and apparently as healthy as the adjoining teeth. In his judgment, it was immaterial whether the pulp died or not, if the antiseptic properties of the chloride of zinc would prevent decomposition. The disintegration of the pulp produced, by its irritating effects on the peridental membrane, all the difficulties we had to contend with.

Dr. BUCKINGHAM stated that oxide of zinc was usually impure. If this is taken and recalcined it will set very soon.

Dr. PETTIT had not had much experience. He had capped when possible. In one case the pain became so severe, in the course of two or three days, as to render extraction unavoidable. He had never filled permanently a tooth so capped. In one case, met with in Toledo, in a recent trip west, the dentist informed him that a slight pain, following the capping of a tooth, induced him to examine it, when the pulp was found entirely destroyed, but with no signs present of decomposition.

Dr. R. HUEY had capped nerves whenever possible. He had one case followed by severe pain, which, failing to relieve after several hours labor, he finally extracted it. He used the oxychloride to fill a portion of the cavity, and had been very successful in bleaching by its use.

Dr. PETTIT had one of his teeth filled by Dr. Truman over ten months ago. Pain followed for a few moments, each day, for a short time, and then gradually ceased.

Dr. WILDMAN had not used it for this purpose, as he had found, in former years, that the use of this article for sensitive dentine had often resulted in the destruction of the pulp.

Dr. TRUMAN thought this an unfair conclusion. He had observed that the use of oxychloride, on a thin plate of dentine, covering the pulp, was attended by far more disastrous results, than when applied directly to it. The cause of this was not very clear to his mind, but the fact was indisputable.

Dr. PEIRCE thought this was owing to the fact that oxychloride would irritate and produce a congested condition of the vessels in the pulp. If these had no room for expansion, there would be increased inflammation and final destruction, resulting from the confinement within the dense walls of the envelope; on the other hand, if the opening was clear, the pulp would expand and the inflammation subside.

The subject was further continued to a future meeting.

Dr. PETTIT spoke of the effects of a rubber plate in the mouth, composed of different kinds of rubber. When the red rubber came in contact with the gum, ulceration took place, and in none of the others. He presented several specimens of teeth, and plaster casts of irregularities, &c. Among the most interesting of these were the following:

No. 1. A block, consisting of three incisor teeth, carved from bone by a farmer, and worn with satisfaction.

No. 2. A superior molar tooth, showing the evil effects of supporting artificial dentures by means of clasps. The clasp had worn its way into the pulp chamber, and also into the nerve cavity of the palatal root.

No. 3. A plaster model, showing remarkable irregularity of the superior incisor teeth, and one supplemental tooth.

No. 4. A plaster model, exhibiting a natural bifurcation of the crowns of the superior central incisors, extending about one-half their length from the cutting edge.

No. 5. A plaster model of a dental arch, so contracted that it will scarcely admit of the end of the little finger.

[Nos. 1 to 5 were received from Dr. M. D. STONEMAN, of St. Anthony, Minnesota.]

No 6. A plaster model, showing irregularity of the left central incisor, and a supernumerary tooth. The supernumerary tooth occupies the proper position of the central incisor, while the latter is in front, and turned entirely around. This irregularity was corrected by extracting the central incisor. Perhaps it would have been better, if circumstances had

permitted, to have extracted the supernumerary tooth, and brought the incisor tooth into its normal position. An additional supernumerary tooth had previously been extracted from within the arch.

No. 7. Two superior molar teeth, with perfect osseous union of their roots, and slight exostosis.

[Nos. 6 and 7 were received from Dr. T. D. SIMONTON, of St. Paul, Minnesota.]

No. 8. A deciduous inferior lateral incisor and a canine tooth, with osseous union of their roots and a portion of their crowns. Received from Dr. D. C. PRICE, of St. Paul, Minnesota.

No. 9. A unique specimen of the complete ossification of the pulp of an inferior molar tooth. The ossified pulp completely fills the pulp chamber, without, however, being attached to its walls. Received from Dr. A. L. BAUSMAN, of Minneapolis, Minnesota.

No. 10. A superior molar tooth, showing a deposit of enamel on each side of the tooth at the bifurcation of the roots.

No. 11. A plaster model of the superior dental arch of a lad thirteen years of age, exhibiting two very peculiarly shaped supernumerary teeth. These teeth made their appearance immediately behind the central incisors, causing the latter to assume a very irregular position, and to separate from each other a distance sufficiently great to admit a large central incisor tooth. The supernumerary teeth are of unequal size; that upon the right side being about half as large again as the one upon the left side. The crowns are very much compressed antero-posteriorly, and have a fissure extending transversely across the grinding surface, and connected with one extending upon the posterior surface at the centre of the crown. The roots are very large; the smaller one being conical in form, the larger somewhat compressed antero-posteriorly, showing some tendency to divide. Neither of them are fully developed, yet they are quite as long as the roots of central incisors ordinarily are. They are curved backward, following the direction of the anterior portion of the palate.

[Nos. 10 and 11 were received from Dr. H. M. SHAW, of Fremont, Ohio.]

[Our thanks are due the above-named gentlemen for these valuable specimens, which will be deposited in the Museum of the College. Doubtless there are hundreds of such in possession of the dentists in various parts of the country, doing nobody any good, until finally they are either lost or broken. If such specimens were forwarded to the Pennsylvania College of Dental Surgery, S. E. corner Tenth and Arch streets, they would be of very great use as a means of illustrating the lectures, and would be gratefully acknowledged. They could be sent by mail, properly packed, at very slight expense. Models of irregularities should

be accompanied with a model of the mouth after treatment, and with a description of the means employed in correcting them.]

Dr. HUEY asked for instruction in a case he had under treatment, that of a pulp that resisted all attempts to destroy by arsenical paste. He had allowed the tooth to rest for three weeks after the first attempt; the second application of the paste was attended with similar results.

Dr. TRUMAN said it was not unusual to meet with pulps resisting all attempts to destroy them by arsenical paste. The cause of this was as yet unexplained, but the fact had occurred in the experience of almost everyone. In proportion to the extent of the congestion of the vessels of the pulp, will there be resistance to the action of the arsenic. In some cases in his own practice, accompanied with this result, there was apparently no inflammatory conditions present, yet there had been entire failure in the efforts to destroy them. His former practice had been to fill such teeth temporarily with Hill's stopping, and allow it to remain six months. If on re-examination the pulp manifested vitality, he capped with the same material, and filled permanently. Cases treated in this way had been examined after the lapse of several years, and were found comfortable and in healthy condition.

NOVEMBER 9, 1869.

At a meeting of the Association, held for discussion, Dr. W. H. TRUEMAN called attention to a new safety valve for vulcanizing, consisting of a brass tube containing fusible metal. He also presented specimens of copper, where explosions had taken place; also a tooth capped with oxychloride, and removed three years subsequently. The pulp had died in this, followed by alveolar abscess. This result he considered prophetic of future trouble in many similar operations.

Dr. SMEDLEY said if this was prophetic of trouble, he was heaping up a large amount for himself in the future, as he had used it in a large number of cases with apparent success.

Dr. BUCKINGHAM stated some cases in the use of oxychloride. He could not see how chloride of zinc could be used and not produce destruction. Try it on the tongue, or on any other tissue, and the caustic effect will be painfully perceptible. He did not wish to condemn it, but felt it must result in the destruction of the pulp.

Dr. SMEDLEY said, where pain had been excessive he had bled the pulp, and then filled. He had one tooth filled with this material in his own mouth. Becoming uneasy from the statements made by prominent members in the profession, he had had it removed, and found the pulp still alive. He recapped, and it so far remains comfortable. This pulp had been treated three times with arsenical paste without success.

Dr. WERT remarked that it seemed to him that failure to destroy with arsenic would probably result in failure with any other material. Success, in his judgment, depended more on constitutional conditions than upon anything else, and, consequently, capping could not prove a general success.

He instanced a case of bleaching a discolored tooth, upon which he had tried all the different modes suggested without result. In desperation he attempted Dr. W. H. Trueman's process of applying nitric acid. The result exceeded his expectations; the change being very marked in a few moments. He subsequently treated it with bicarbonate of soda to neutralize any remaining acid.

Dr. W. H. TRUEMAN instanced a case of exposed pulp. The patient refused to have the tooth extracted. After several years the tooth was again examined, when the pulp was found capped with secondary dentine. The individual was addicted to the use of tobacco, but he thought the conclusion hardly justifiable that the constant use of this would produce a re-development of osteo-dentine. This would be too much like those we often see arrived at in our journals, upon equally slender premises.

In regard to the use of nitric acid in bleaching, he would say, that he had studied its effects in teeth in his own mouth. He had found a few seconds sufficient to produce a change of color.

Dr. WERT explained his mode of manipulation. He used a gold instrument and pure nitric acid. The root was first filled tight with cotton. The nitric acid was kept in the cavity one minute by the watch. On removing the acid the cavity was freely syringed and dried. He then applied the bicarbonate of soda; after which cotton, saturated with creasote, was kept in the cavity for two days. Upon examination, the tooth was found as dark as before treatment. It was then syringed again, and the acid reapplied, allowing it to remain five minutes. The action was not as rapid upon the second application, but the tooth was restored to nearly its natural color. He had not seen the tooth since the last application.

Dr. W. H. TRUEMAN called attention to the necessity of using chemically pure nitric acid. He followed the use of this by chloride of lime, which would take up any remaining quantity of acid, and also continue the bleaching process. He also followed this with bicarbonate of soda and ammonia.

Dr. BUCKINGHAM had never known nitric acid used for bleaching, but had for the destruction of pulps.

Dr. PEIRCE said that the affinity between the acid and dentine would be very strong. It would follow the tubules, and remove the parietes and a large proportion of the tooth substance.

Dr. BUCKINGHAM remarked that this would be good theory if we knew whether the acid followed the animal matter of the tooth or removed the

inorganic. Nitric acid acted upon animal tissue and gave it a yellow color. If the animal matter in the tubes is changed from a dark to a yellow the tooth will necessarily be changed. He considered the subject an important one.

In regard to the valve presented by Dr. W. H. Trueman, he could say he had but little faith in it. Fusible metal loses its character by a continued high temperature. The thermometer does not always indicate the amount of heat. This can be demonstrated by allowing a small escape of steam, when the mercury will rise suddenly a number of degrees. In some of the large factories they use something to keep the water in constant circulation. It is merely a question of time how long our vulcanizers will last. The period has about arrived when the first crop disposed of were beginning to blow up.

Dr. W. H. TRUEMAN said, that a fusible metal that will melt at 350°, may be run up to 370° before it will blow out. In a smooth glass vessel heat may be raised to a high degree without boiling. The least jar relieves the latent heat and sudden expansion takes place. The same thing may occur in vulcanizers and produce explosions.

Dr. WERT had had his vulcanizers made very thick. He had found that, at 320°, the application of a wet finger to the vulcanizer produced a hissing sound. He therefore uses this as an additional test.

Dr. BUCKINGHAM suggested that a disc of copper, properly arranged, should be attached to our vulcanizers. These discs could be tested to known strengths, and would indicate the amount of force. J. T.

Editorial.

The new year finds us once again assuming the duties of one of the editorial corps, after an interval of nearly two years. We return to the charge aware of its cares, perplexities, annoyances and responsibilities, but with an earnest interest and desire to aid in the advancement of dental literature and science in general, and this Journal in particular. The DENTAL TIMES was originally designed, and was, for several years, exclusively an original journal. It is our aim to again make it such an one; the mouth-piece only for articles not to be found in each monthly. At the same time we shall have no hesitancy in reprinting some valuable paper, properly credited, which has appeared in some other journal. It is hoped that our friends, subscribers, and those interested in dental progress, will send us communications, which we promise to present in the best possible shape to our readers. This journal is especially identified with the best interests of the Pennsylvania College of Dental Surgery, and it is hoped that the friends, patrons and alumni

of that Institution will give us encouragement, not only by subscriptions to the TIMES, but by contributing articles for its pages. We ask them for this aid, promising, with such assistance, to place the DENTAL TIMES above all competitors.

The following gentlemen have been appointed agents for the DENTAL TIMES, and are authorized to receive subscriptions: Drs. H. R. Phillips and G. K. Bagby, for Southern States; Dr. C. E. Wilkinson, for Pennsylvania and New York; Dr. W. R. Rose, for New England States; Dr. J. E. Peirce, for Western States. G. T. B.

MALE vs. FEMALE MEDICAL STUDENTS.

The medical fraternity, and particularly the medical students of Philadelphia, have recently been greatly agitated by the introduction of women as students into the class of the Pennsylvania Hospital. The facts of the case are as follows: Without consultation with the medical or surgical staff of the hospital, and without statements to students, at the time of purchasing their tickets, that women were to be admitted to the hospital, the Board of Managers determined to allow them the privileges of attendance on clinical lectures. The first that was known of this change by the male students was from a statement made by one of the surgeons that, at the next lecture, women were to be admitted, and therefore they might expect that a certain line of surgical cases (syphilitic) would not in future be presented to them at the hospital clinic. The students who had purchased tickets of the Managers with the understanding that the same facilities, as in former years, for obtaining knowledge would be open to them, were extremely dissatisfied, and as a result, on the appearance of the women at the next lecture, a number of students greeted them with hisses, hootings and general ungentlemanly behavior. For this breach of politeness the medical students were censured by the entire city and country press, while the propriety of the presence of women at such clinics was considered by some as questionable, and by all as a distinct question from ungentlemanly conduct. On the side of the women students it was urged that every facility for instruction should be given them that was given to male students. That, as students of the hospital, holding its tickets, they were entitled to all its privileges, and that, notwithstanding their first reception, they intended to be present, at least at two clinics per week, there being two medical and two surgical per week, and that such knowledge was appropriate for women to possess in order that they might be properly fitted to perform the avocations of a physician. It was also urged that in other countries, in different cities, and even in our own city, in its largest hospital, this privilege had been extended to women without injury to either male or female students.

On the part of the male students it was contended that it was an innovation on an established custom, which, though truthful, was not logical; that patients objected to expose their persons before mixed classes of students; that they would be debarred from witnessing many operations, and very many morbid conditions, which the delicacy of the attending surgeons or physician, or patient, would prevent from exposure under such circumstance. That as women claimed to be actuated by a desire to attend to the diseases of their own sex, it was inappropriate for her to be present, as the great majority of patients presented were males, with diseases which women would not be called upon to treat.

The students of the two colleges, University and Jefferson, by and with the approbation of their Faculties, determined not to attend the hospital clinics if "mixed clinics" were tolerated. Both sides appealed to public opinion through the newspaper press in able and well-digested articles, and in this appeal the public said both sides were right, both were wrong. Women should have instruction in medicine equally with men, but it should be separate instruction. It also blamed the hospital managers for not telling students, at the time of application for tickets, of the change in their rules. The women, finding public opinion so strongly against them, receded from their original position, and were willing to have separate clinics for themselves, once per week. The Board of Managers of the hospital have recently, in a communication to the Medical and Surgical Board, requested them to hold alternate clinics for men and women students. Thus the subject stands at present. Our own belief is, that in this judgment public opinion was right.* G. T. B.

GOODYEAR RUBBER COMPANY.

Every thing which looks to an overthrow of this unjust monopoly must be welcomed by the suffering dental profession. We, therefore, are pleased to see that some others besides the dentists are attempting to slay this dreadful Goliah.

UNITED STATES SUPREME COURT.

In the Supreme Court, to-day, the case of the Providence Rubber Company against Charles Goodyear, executor of Charles Goodyear, deceased, the Union Rubber Company and the Phœnix Company, an appeal from the Circuit Court for the District of Rhode Island, was taken up, and will occupy two or three days in the argument. The case involves the validity of the extension of the Goodyear patent, which, it is alleged, was obtained by fraud on the Commissioner, and many other minor questions. The argument was commenced by Mr. Payne for the appellant.—*Associated Press Report.*

* Since the above was in type we learn that the women have, *as usual*, gained their object, a decision having been arrived at by the Board of Managers and the Medical and Surgical Board, to have a "mixed clinic," one surgical and one medical per week.

We have received the following contributions to our College Museum, for which, in the name of those seeking knowledge, we return our thanks: From Dr. F. A. Ramsay, Norristown, Pa., a valuable specimen of alveolar necrosis; Dr. Du Bois, Greenville, Ala., rare and various abnormal conditions of teeth, also teeth taken from the ancient mounds of Alabama; Dr. F. R. Thomas, rare specimens of dental exostosis and atrophy; from Messrs. Worrall & Babcock, the displaced tooth; and cast showing hypertrophy of gums, referred to in their articles published in the present number of the Times.

Selections.

SCARIFICATION OF THE GUMS IN DENTITION.

At a meeting of the "Edinburgh Obstetrical Society," Dr. Cairns gave the following views on this subject, which we present in full to our readers, as they appear in the *Edinburgh Med. Journal*.

"I. Is scarification in dentition productive of any beneficial result? If it is so, in what do its good effects consist? The advantages alleged to accrue from the operation, as contained in the several works which I have consulted, may all be summed up in the following: First, the relief of local pain; and, second, the prevention and arrestment of convulsions, laryngismus stridulus, diarrhœa, &c.

1. Scarification, according to its supporters, relieves local pain. Conceding, meanwhile, that this assertion is true, let us inquire into the grounds on which the assertion rests. Now it certainly cannot rest on the declaration of the little patients on whom the operation is performed, because they have not yet acquired the power of speech—a circumstance indeed which renders the treatment of the diseases of children in general of a very difficult and unsatisfactory nature, preventing them as it does from correctly indicating either the precise seat of their sufferings, or the actual effects of the remedies employed. Well, if the allegation is not, and cannot be founded on the ground I have mentioned, it must, in these circumstances, be altogether and entirely of an inferential character. Now, the value of inferences is purely determined by the character of the data from which they are drawn. If the data are true, the inferences may be valid or they may not; but if the data are not true, the inferences must, as a matter of course, be utterly worthless. In the present case, then, what are the data from which it is inferred that scarification is productive of relief from pain? These data will, I think, be found on inquiry to consist in the tense, tumid and congested condition of the gums. The matter stands thus: the gums, in the process of dentition, being in a tense, swollen and inflamed state, are painful; and, by relieving the tension, tumidity and congestion, by means of incisions, you thereby relieve pain. This, I opine, is a correct and fair statement of the case. Well, now, I demur entirely to the alleged fact, that in the *ordinary* process of dentition the gums are either tense or swollen. It is quite true that there exists over the site of the approaching tooth an evident fullness; but this condition is caused, in all ordinary cases, by the presence of the tooth itself. The tissue overlying the tooth is not put into a state of strain by

the tooth, as the term tensity would lead one to suppose. No such thing; against such tension nature makes full and ample provision, by causing the subjacent gum to undergo gradual absorption in proportion to the growth of the tooth itself. The tooth is not *pushed* up, it *grows* up; and as *it* increases in growth, so do the overlying tissues become absorbed, thereby rendering tension impossible. Neither is there swelling in the ordinary sense of that term, because nature guards effectually against the infiltration of serum, by causing the growth of the tooth to be sufficiently slow, so as to give the vessels concerned abundant time to accommodate their calibre to the circumstances by which they are surrounded; and if a true swelling does in any case actually form, that is to be regarded simply as an accidental occurrence, and to be treated, of course, as it would be in ordinary circumstances, but it is in no wise essentially connected with the process under consideration. If, therefore, there is neither tension nor tumefaction, scarification is useless as a means of relieving pain, so far as regards the alleged disturbing influences of these two conditions. But what of inflammation? Simply this, that by abstracting blood from an inflamed part, you do not, in the least degree, either reduce or modify the inflammation. The part continues to be as red, as hot, and as painful as before. Nor do I hold it of much consequence to be told that the child has become more quiet after the operation, and must therefore have obtained relief by its means; because, unless its advocates are prepared to prove the result to be invariable—which they are not—I am fully entitled, in the circumstances, to assume, that such relief may have followed in spite of the operation, just as many patients have been found to recover from certain diseases in spite of the very questionable treatment to which they may have been subjected.

2. Scarification is alleged to prevent and arrest convulsions, &c.

Now, as a prophylactic remedy, the operation can only be admissible under certain conditions: 1*st*. On the ascertained fact, that convulsions are an invariable accompaniment of dentition. 2*d*. That the operation uniformly, or at least generally, prevents their occurrence. The question, therefore, is, do these conditions hold? I affirm they do not, and on the following grounds: because convulsions, so far from always coexisting with the process of dentition, do so in reality in a very small proportion of cases. They constitute, in fact, not the rule, but the exception. And further, the object sought has in general not been attained; that is to say, convulsions have just as frequently followed as they have preceded incisions of the gums. So much for the preventive; and as regards the alleged curative agency of scarification, several questions naturally suggest themselves:—

(1.) Does it necessarily follow that dentition is the real exciting cause of the convulsions, merely because the latter happen to be concurrent with the former? Every one, I dare say—even the most zealous advocate of the operation—would unhesitatingly answer in the negative, when the question is put in this pointed and direct manner; nevertheless, I am rather inclined to think that there exists in the minds of most practitioners a strong predisposition to attribute every case of convulsions which occurs in a child within two years old to the so-called cutting of a tooth, and to that alone, unless other causes are so manifest as can hardly escape notice. Nor is the reason of this far to seek; for, in the first place, it is universally admitted by every member of the profession, that dentition may, and

does, occasionally, induce convulsions; in the second place, there exists a strong tendency in the human mind to connect certain effects with their most commonly received causes, whether true or false, and this circumstance has always operated in a very special manner in the minds of medical men.

(2.) A second question which suggests itself is, has a recurrence of the convulsive fits, which happen to take place during dentition, always been prevented by scarification? An affirmative answer to this question would justly be held quite conclusive, at least as regards the particular circumstances referred to; but unfortunately, I have not been able to find any one, within the compass of the research which I have made, who ventures to give the desiderated answer. On the contrary—unlike those who dogmatically proclaim, as an infallible remedy for this and that disease, this and that specific, which no other than themselves have ever been able to verify—even the most strenuous supporters of scarification allege nothing more than simply that after the operation has been performed, the convulsions have ceased to recur only now and again.

(3.) And this brings us to a third question, viz: Whether, in those cases in which convulsions have ceased after the application of the lancet to the gums, the use of this instrument is to be regarded as the real procuring cause of their arrestment? Now, I do not by any means venture to say that it is not. This were too audacious by a great deal; but I do say, and without the least hesitation, that there exists more abundant data from which to give an answer in the negative than there do from which to give one in the affirmative. What, we ask, are the grounds on which the scarificator is employed? Because, say its advocates, after being applied, convulsions occasionally do not occur. And that is really the only answer which can be given. Very good; but when they are again asked, if they can affirm with certainty that the use of the lancet has been the actual and sole means of stopping the convulsions, they feel obliged to be somewhat more cautious in the answer which they give. Their reply then is, It may be, or it may not be—we cannot absolutely say which. Well, in these circumstances, we must be excused for expressing our humble opinion that the greater probability is, that it has not been so; first, because the use of the lancet has just as frequently been followed by the *recurrence* of the convulsions as by their *discontinuance;* second, because their non-recurrence may have been a *mere matter of coincidence and nothing more.* It is well known for example, that in different children convulsions differ, both as regards their number and duration. In one child there is often only one convulsive attack, sometimes of short and sometimes of considerably long duration; in another, we often find two, the one either following the other in close succession, or at a longer interval. Sometimes we find three, and so on: but when they are dependent on dentition, or other local irritation, they always prove of a self-limiting character. Suppose, now, that in either of these cases you incise the gums, and that, after doing so, the convulsive attacks cease to return, are you entitled to give the credit to the lancet? If you say yes, I maintain that in the circumstances I am equally entitled to say no; because, in all probability, the convulsions had entirely ceased before the gums had even been touched by the lancet.

The same arguments which have been employed in the case of convulsions apply equally to the other diseases which I have mentioned as

concurring with dentition, and, therefore, I may pass them over without further notice, merely adding that, although diarrhœa is perhaps one of the most common comitants of dentition, it seems somewhat strange that scarification should be so seldom practised, or even recommended for arresting that most debilitating of all the ailments to which infants are liable.

II. Having considered the beneficial, I now proceed to notice, in the second place, the prejudicial effects of scarification.

1. And here I allege, in the first place, that it is injurious, because it impedes the process of dentition. During the last few days I have asked several professional brethren with whom I have come in contact, who approve of the operation in question, for what reason they do so? and the gist of the answer which I have received from each has been this: "Because," say they, "the lancet does at one stroke what nature would require a considerable time to accomplish to let the tooth through." And this quite accords with what we find in some of the books. Now, we aver the opposite. We aver that the use of the lancet, instead of rendering dentition more easy, makes it in reality more difficult. And here we must observe that, in scarifying the gum, three different modes have been recommended—1*st*, by making a single incision; 2*d*, by making a crucial incision; and 3*d*, by making an elliptical incision, and removing that portion of the gum which overlies the tooth. Well, if either of the first two methods is adopted, in nine cases out of ten you have speedy reunion of the lips of the wound, thereby leaving matters exactly as they were before. If, as recommended by some, you go on repeating the incisions, you have just the same result following; thus rendering it extremely difficult for us, at least, to perceive how the approach of the tooth can be facilitated in the least degree by these means; while, at the same time, the hard cicatrix which has been formed must require longer time to become absorbed as the tooth approaches than the soft natural tissue of the gum. If the wound heals by ulceration—and by this process it must do so, when the third method is employed—you do certainly obviate thereby the absorption of the gum, and thus seem to assist nature. But this, after all, is more apparent than real; because absorption is undergone not only in that portion of the gum which lies over the summit of the tooth, but also in the portions toward its sides—portions, be it observed, which are left altogether untouched. But even although these portions were also removed, the truth of our averment would, in our opinion, be only strengthened thereby; and in this way, because you would thus expose a greater portion of the tooth to atmospheric influence, premature exposure to which, by the removal of its natural covering, would give a material check to its growth and development. Consider, also, that by the operation, simple though it seem, you give a greater or less shock to the nervous system of the infant—and it is universally admitted that an infant at this period is in a state of high susceptibility, that you excite more or less inflammation, thereby increasing the suffering and irritability of the little patient; that you cause the loss of a certain quantity of blood, of which a child is highly intolerant, and particularly those children on whom the operation is performed, being generally of delicate and strumous habits; that you aggravate the painful condition of the gums, thereby rendering sucking a difficult operation, and preventing the infant from obtaining a proper supply of nourishment.

Consider, we say, these circumstances, and the injurious effects which they must necessarily produce on the general constitution, and through it on the growth of the teeth, rendering that process, as they must do, unusually tedious and slow.

2. We allege, in the second place, that it may lead to fatal hæmorrhage. We are not in a position to state how often this result has followed from the operation; but if all the cases which have occurred had been recorded, and were collected, they might be found to amount to no inconsiderable number. At all events, it is well known that such cases have occurred, and, indeed, it is only very recently that a case of this nature was reported to this Society by one of its members. To this, however, it may be objected—1*st*, That in those cases in which the child has died from loss of blood, the incision may have been made too deep; our reply is that the incision is recommended to be made deep, so deep as to reach the tooth. 2*d*, It may be objected, that fatal cases may only have occurred in those children which happened to have the hæmorrhagic diathesis; we answer, that even although this were granted, you cannot discover whether this diathesis is present or not, until you make the incision, when the discovery is too late. 3*d*, It may also be objected, that the risk alluded to occurs so seldom that it need not act as a deterrent: to this we reply, that the untoward results under consideration having happened even once or twice, renders it at least possible that it may also occur in the very case in which you are about to operate; and moreover should it do so and should you tell the parents on inquiry that you were aware that such an event might possibly occur, I rather fear that the parents would not hold you altogether blameless in the matter, and that they would bear you a secret grudge ever after.

3. I allege that it tends to perpetuate a custom which, to say the least of it, is of a doubtful character. Probably one of the main reasons why the operation is so generally performed is, not in reality from the good effects which are expected to ensue from it, but because it is usually done in such circumstances. Others do it, and in order not to appear singular or culpable, I must conform to the general practice, whether the issue should prove favorable or the reverse. In this way did the treatment by blistering, bleeding and violent drugging become transmitted from generation to generation, age after age, producing, as it is now universally allowed to have done, the most direful results. And in the same way has been handed down the operation in question, which, though uncertain and doubtful in its results, continues to be in high favor and general use as a time-honored custom. On this point, however, we do not enlarge, but proceed, as was proposed, to inquire.

III. If, in the circumstances, scarification is justifiable? We allege that it is not. 1, Because it inflicts unnecessary pain. The objection, observe, is not grounded on the fact that pain simply is caused to the child. Such an objection were absurd; because, although the medical practitioner holds it to be one of his prime functions to relieve pain, in many cases he can only fulfill that function by employing remedies which are themselves of a pain-giving nature. But this is not the question. The question is, am I warranted in employing a remedy which, so far as can be ascertained, does not relieve the pain which it is intended to do, and which remedy is itself painful both in its application and results? I maintain that in these circumstances I am not justified in doing so, and particularly when I remember the effects which scarification on one occasion produced in my

own person. For it so happens, that when some years ago, my last wisdom-tooth was making its appearance, the late Professor Miller, at my own urgent request applied the lancet over it, but the result was, that instead of experiencing relief from the operation, it kept me, on the contrary, in a state of the most extreme suffering for days to come; the remedy, in short, having proved a thousand times worse than the disease.

2 It superinduces some of those very conditions which it professes to remedy. I allude in particular to tension, tumefaction and inflammation, the relief of which, it will be remembered, was alleged as a reason why scarification should be performed. On that occasion, I simply endeavored to show that the treatment recommended had no rational grounds on which to rest; I now go a step further, and aver that scarification actually produces these results. Inflammation it must and cannot but excite; because, in virtue of a well-known physiological law, wherever you occasion a breach in living tissue, more or less inflammation results, in order to repair the breach which has been made. Again, in an inflamed part there is always more or less swelling, owing to the pressure upon the veins, which causes the exudation of serum into the surrounding cellular tissue. And, lastly, there is tension; because, whether the scarified part heals by the first or second intention, there is, in either case, contraction of the tissue, and consequent tension, if an unyielding structure like the tooth lies underneath.

I shall not be so bold as to affirm that scarification actually excites convulsions; but, considering the extreme sensitiveness of the gums, and the highly nervous condition of the child in some cases of teething, I do think that that operation is abundantly sufficient to act as an exciting cause of them. And it is certainly a fact, that there are some parents who will not allow the gums of their infants to be incised on any account, because in the case of former children, they have observed the operation to be followed by convulsions; and parents are very acute and often very correct observers in reference to the ailments of their children—a fact which renders their testimony in such matters of no inconsiderable value.

3. At the best, it is a mere experiment. This, I think, cannot be denied, with whatever view the operation may be performed, whether to relieve pain, or whether to arrest convulsions, or any of the other symptoms which have been mentioned as coincident to dentition. If you perform the operation to relieve pain, you do so simply as an experiment, because, in the first place, you do not know if the pain from which the child appears to suffer is due to the state of the gums at all; it may depend upon causes totally different. In the second place, granting that the gums *are* the prime source of the irritation, how do you know that the *part* of the gum which you incise is the real seat of the pain? You perceive a certain portion of the gum to be somewhat prominent, and find at the same time that the child gives certain expressions of suffering, and you thereupon immediately leap to the conclusion that the pain is occasioned by that particular part of the gum. Are you *certain* that it is so? You are not; you cannot be. The *greater* probability is, that the irritation is entirely due to the growth of *a* tooth, which, owing to the early period of its development, gives no indication whatever of its appearance. In the third place, even although you could hit exactly upon the precise tooth which caused the pain, how do you know whether it is the *superficial* or radical part of the tooth which gives rise to the pain? Whoever has suffered from toothache, must know that the pain in *many* cases arises

from the *root* of the tooth, and not from the crown, showing that the former is just as likely to be the seat of pain as the latter; and consequently, that in scarification, the object sought will most probably prove altogether abortive, and, therefore, out and out experimental.

And, as regards convulsions, etc., scarification of the gums is a thousand times more doubtful in its results than as regards the relief of pain. Who can deny on how many occult causes such phenomena may actually depend? But simply because a child happens "to be getting its teeth" while a convulsive fit occurs, the convulsion is at once attributed to the state of the gums. The gums are forthwith lanced, and if the convulsions cease, the lancet gets the credit; if they do not cease, *as in general they do not*, the lancet nevertheless is extolled as having done all that could have been done to avert bad consequences. But now, allowing scarification to be nothing more than an experiment, is it or is it not justifiable? To this I reply, that it is only justifiable on certain grounds. An experiment is not justifiable—1*st*. When there is no essential connexion between the disease and the alleged cause for the removal of which the experiment is made. 2*d*. When it has repeatedly failed to produce the desired result. 3*d*. When it is likely to be more injurious than beneficial. These points, however, I simply state without enlarging upon them, having greatly exceeded the limits to which I had restricted myself."

While we are not prepared to endorse all of the views of Dr. Cairns, which we have laid before our readers in full, yet at the same time we are no advocates of indiscriminate scarification of the gums of children during first dentition. We can hardly suppose it possible for anyone who has had experience in this matter to deny that the lancing of tumefied gums is a relief; or that convulsions may be prevented by this operation.

While it is true that it is a question with many whether the too early scarification of the gums does not impede the eruption of the teeth, from the cicatrix resulting offering more resistance to the advancing tooth than the gum in its original condition, at the same time we had supposed that every one would admit the relief it affords to the tension exerted in the tumefied part.

If we deny that the irritation of dentition is capable of producing convulsions, then Dr. Cairns' theory that scarification does not arrest these nervous disorders but aggravates them, may be a correct one.

It is true, fatal results have attended some cases where this operation of lancing the gums has been performed, but in such cases only where the child has afforded unmistakable evidence of a hæmorrhagic diathesis, as is shown by blood deficient in fibrine and red globules, and consequently wanting in the power of coagulating; or a condition of blood due to the action of mercury—in other words impoverished.

For we know that mercury will decompose blood; and Dr. Wright, who has analysed the blood of patients under mercurial action, states that it is materially changed, containing more water, and being more prone to putrefaction than healthy blood, the destructive agency depriving it of one-third of its fibrine, one-sixth or more of its globules, and at the same time loads it with a fœtid matter, the product of decomposition.

In our opinion Dr. Cairns has advanced nothing which proves the operation of scarification a dangerous and useless one in all cases; but, on the contrary, we consider it one of great benefit in the vast majority of cases where the proper indications exist for its performance.—*Editor of American Journal of Dental Science.*

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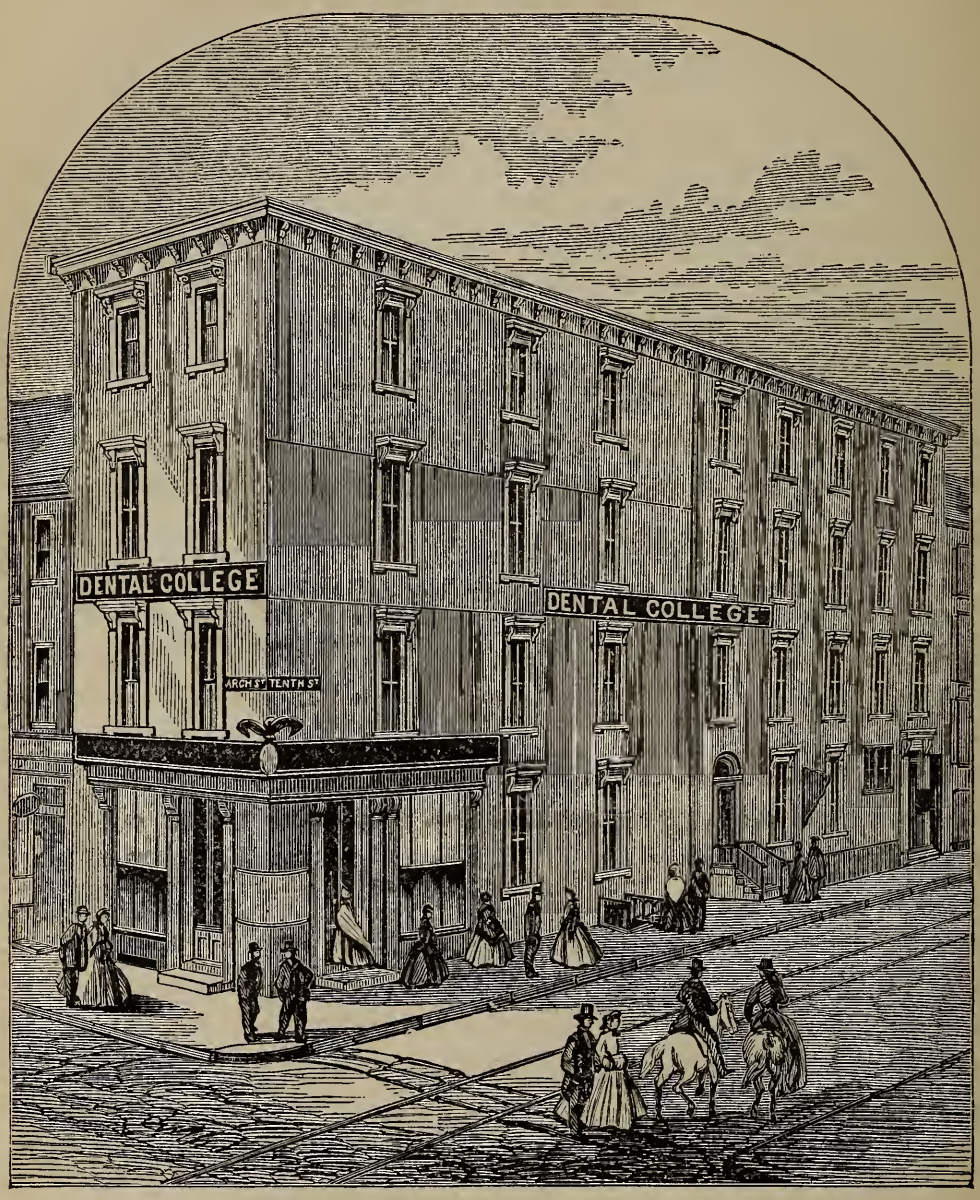

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1206 *Vine Street.*

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Fourteenth Annual Session, 1869-'70.

PRELIMINARY LECTURES AND INSTRUCTIONS.—The Dispensary and Laboratory of the College will be opened on the 1st of September, where ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability; and during October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday in November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation, and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

ANATOMY AND SURGERY.

The instruction in this department will embrace a plain and comprehensive view of the structure of the human body. The lectures and the demonstrations will be given over *the dead body dissected for the express purpose* of elucidating the subject. With the same object, vivisections on the lower animals, while under the influence of an Anæsthetic Agent, will be employed. Such description of the comparative anatomy, microscopical structure and connections of the teeth, as their importance may demand, will be fully given. The valuable and extensive collections of Anatomical Preparations of the incumbent of this chair, consisting of wet and dried specimens, papier mache manikins, models in wood, and accurate French plates, will enable him to illustrate his course of lectures very clearly.

In addition to the above course, a Surgical Clinic will be held by Doctor Forbes during every week, for the purpose of performing such operations in oral and general Surgery as may be deemed advisable to advance the student in this particular branch of knowledge. The cases will be selected from a dispensary which the Faculty have established.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical pecularities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

CLINICAL INSTRUCTIONS.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the demonstrators.

In the Operative Department.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

In the Mechanical Department.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

Practical Anatomy.—The great facilities for the study of practical anatomy to be found in Philadelphia, in several well ordered and supplied dissecting rooms, present to the student advantages for its prosecution superior to those offered in any other city.

Hospital Clinics.—In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of dentistry, the celebrated hospitals and clinics of the city constantly enable the students to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Pennsylvania and Philadelphia Hospitals, two of the largest eleemosynary establishments in the world, are open to medical and dental students, free of charge.

FEES.

Matriculation, (paid but once,) - - - - - - - - -	$5 00
For the Course, (Demonstrator's ticket included,) - - - -	100 00
Diploma, - - - - - - - - - - - - - -	30 00

TEXT BOOKS AND WORKS OF REFERENCE.

Leidy's or Gray's Anatomy; Carpenter's or Kirk's Physiology; United States Dispensatory; Pereira's, Biddle's or Stille's Therapeutics; Fownes' Elements of Chemistry; Regnault's Chemistry; Lehmann's Physiological Chemistry; Hartshorne's Principles and Practice of Medicine; Wood's Practice; Tomes' Dental Physiology and Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Wildman's Instructions in Vulcanite Work; Barker on Nitrous Oxide; Gross' or Erichsen's System of Surgery; Paget's Surgical Pathology, or other standard works on the subject.

QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupilage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before

the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

CANDIDATES FOR GRADUATION WHO HAVE NOT ATTENDED LECTURES.—Dentists who have been in continued practice since 1852, are eligible to be candidates for graduation without attendance on lectures. The candidate for graduation must present satisfactory evidence of his having been in practice for the allotted time, also of his good standing in the profession. He must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must present specimens of his workmanship. He must undergo a satisfactory examination by the Faculty, on each of the branches taught by them; when, if qualified, he shall be recommended to the Board of Trustees, and if approved, shall receive the degree of Doctor of Dental Surgery. Of this class of graduates, the matriculation and diploma fees only are required.

For further information, address

T. L. BUCKINGHAM, Dean,
No. 1206 Vine Street, Philadelphia.

BOARD can be obtained at from $4.00 to $8.00 per week.

ALL THE INSTRUMENTS AND TOOLS required can be procured for from $15.00 to $20.00.

THE

DENTAL TIMES.

VOL. VII. PHILADELPHIA, APRIL, 1870. No. 4.

Original.

CLASS MICROSCOPES.

WITH REMARKS UPON THEIR USE IN TEACHING.

[Read before the Biological and Microscopical Section of the Academy of Natural Sciences of Philadelphia, and directed to be published.]

BY JAMES TYSON, M. D., LECTURER ON MICROSCOPY AT UNIVERSITY OF PENNA.

As the result of an extended experience in the use of class or clinical microscopes, both in teaching histology and clinical medicine, the writer feels justified in briefly asking the attention of the section to a subject which he cannot but consider of importance to all interested in demonstrative teaching.

A class or clinical microscope may be defined as one which admits the study of microscopic objects while it is being passed about a class from member to member.

The use of such instruments finds its advantage in the importance of exhibiting to the student of natural science the object as it naturally presents itself, undistorted by defective drawing.

The indications in class microscopes, in addition to those of the ordinary compound instrument, are these: 1st. They should permit the object glass to be clamped at the proper focal distance, while there still remains provision for differences in vision which necessarily occur among a large class of students; 2d. They should permit the object to be tightly clamped upon the stage of the microscope; and 3d. The clamp should be so attached to the stand that it will secure an unchanging illumination for the object, by transmitted or reflected light, while the instrument is being passed around the class.

The first microscope of this kind which accomplished these objects at all satisfactorily, was the clinical microscope of Dr. Beale, as improved by Mr. Highley, of London, and of which the microscope first exhibited is one.

The figure largely explains itself—*a* is a cylindrical tube attached to the base *h*, and expanded into a trumpet-shaped extremity, between which and two spring clamps attached at the edge of this expanded extremity, is placed the slide carrying the object. One of these clips is provided with a screw, by means of which it can be further tightened. Within

Fig. 1.

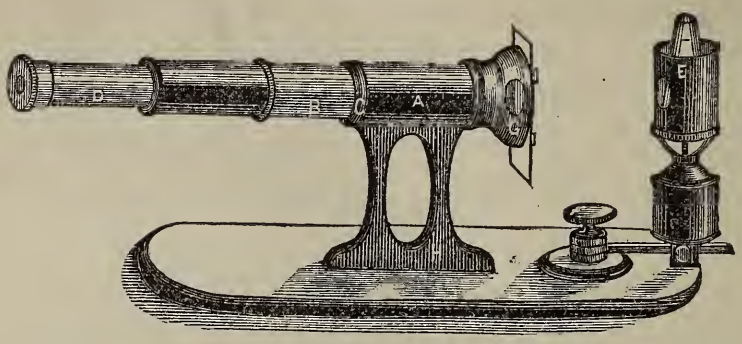


Fig. 1.—Beale's Clinical Microscope improved by Highley.

this tube is a second of the same length, (concealed by the outer tube in the drawing,) which receives the tube *b* carrying the object glass; *c* is a brass milled ring, by turning which the object glass may be immovably fixed at the proper focal distance, the adjustment being made by the hand applied to the tube carrying the objective; *d* is a tube carrying the eye-piece, made to slide within the tube *b*, by which movement the microscope is well adapted to varying vision, since a considerable movement is here permitted without changing the image formed by the object glass, whereas, a very slight movement of the tube carrying the latter would seriously disarrange the picture; *e* is the lamp, which, when placed directly in front of the object, illuminates it by transmitted light, and when moved around to the side on the centre *f*, permits its light to fall through the opening *g*, thus illuminating the object by reflected light. When the object is adjusted and clamped accurately in focus, it will be seen that the microscope can be passed from one to another without much risk of the image being deranged. This instrument, with lamp and two object glasses, an inch and a quarter inch, is sold for £3 in London.

But the defects in this microscope are two. 1st. The focal adjustment, for high or low powers, must be made by moving a tube within a tube, and by the hand directly applied to the former; this becomes especially irksome when the microscope must be held up in the other hand while it is being accomplished. 2d. The relation of the slide to the trumpet-shaped extremity is such, being tightly compressed against it, that in an extemporaneous preparation the thin glass cover is apt to be pushed off, and the object ruined.

It was not until these defects were amply realized, by actual experience,

that the writer called the attention of Mr. Jos. Zentmayer, of this city, to them, who devised and constructed the microscope figured below.

Fig. 2.

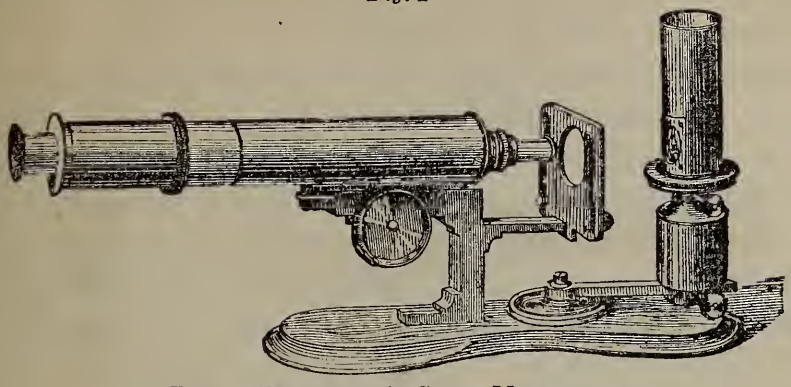


Fig. 2.—Zentmayer's Class Microscope.

It will be seen that in this instrument, the focal adjustment is provided for by a milled head, rack and pinion, thus obviating the inconvenience resulting from a movement of a tube within a tube by the hand applied to the former, while the objective is fixed at proper focal distance by removing the milled head, thus obviating any interference by members of the class. The allowance for differences in vision in different individual members of the class is accomplished by a draw tube movement, similar to that in the instrument of Dr. Beale, easily recognized in the diagram.

Again, the stage is independent and separate from the tube carrying the objective, so that the second inconvenience of Dr. Beale's microscope is also obviated. The secure clamping of the slide is likewise accomplished by a screw passing through one of the clips. The arrangement of the lamp is precisely similar to that of Dr. Beale's instrument; but in Mr. Zentmayer's later instruments the chimney is a metallic one, with a piece of mica covering the opening opposite the object glass, thus obviating the inconvenience involved in breakage, uncleanliness and handling a separate glass chimney. We do not hesitate to say, that for the purposes of a class microscope alone, we have found this instrument by far the most satisfactory of any we have used; it is, indeed, the only microscope which conveniently answers all the indications of a demonstrating instrument. In one respect only is it inferior to Highley's Beale. It is something heavier, but this is a trifling inconvenience. The wooden base is, moreover, hollowed out upon each side, as seen in the cut, furnishing thus a convenient means of holding the instrument, and when we consider that the portion *h*, of Beale's instrument, is not practically adapted for seizure by the hand, the inconvenience of weight is counterbalanced by the facility in handling. This provision could, however, be easily supplied in the wooden base of Beale's instrument.

This microscope, with lamp, two eye-pieces and two objectives, a $\frac{1}{5}$ and an $\frac{8}{10}$, neatly packed in walnut box, are sold by Mr. Zentmayer for $58

The objectives are the same as those he furnishes with the so-called "army stand," and are well adapted for the objects for which intended. Moreover, the workmanship, in all portions, is the very best, which is not the case with class microscopes generally.

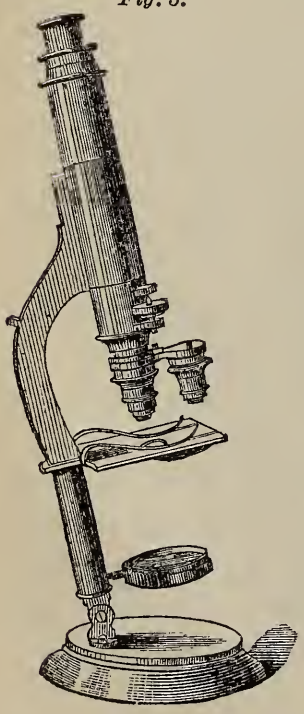
It sometimes happens, however, that it is desirable to use a microscope as well for purposes of ordinary microscopic study as for illustrative demonstrations; and where students are taught the use of the microscope, and to study tissues for themselves, this becomes important. Now, these class microscopes, from the necessarily horizontal position of the tube, are evidently most inconvenient for such study, and to obtain a double set of stands involves an amount of expense which few teachers are able to bear; hence, it becomes of very great advantage to have a microscope which can be used for both purposes. Such a microscope is the class microscope of Mr. Charles Collins, of 77 Great Titchfield street, London, and constructed under the direction of Dr. Lawson.

This microscope was described quite two years ago in the London *Medical Times and Gazette*, but we are not aware of its having been exhibited or used in this country prior to the importation of this instrument by the writer.

Such a microscope is exhibited, and figures 3 and 4 explain its appearance and use.

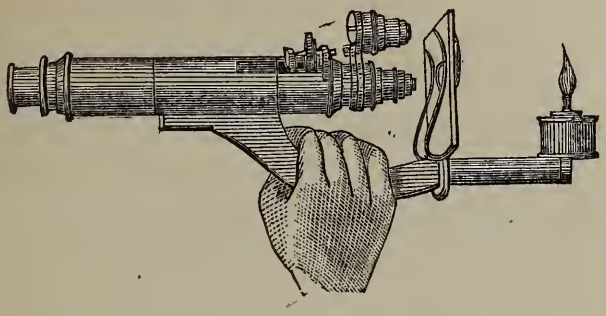
Fig. 3 presents the microscope as an ordinary working stand. To convert it into a demonstrating microscope, we have only to draw it out of the mirror tube and slip on the lamp, as in Fig. 4. This microscope is, moreover, provided with milled heads, rack and pinion, for coarse adjuster, (not shown in the figures,) and a screw fine adjuster, so that it is, indeed, quite complete. There are no means provided, however, to prevent tampering with the adjustments by students, so that the object is apt to become deranged in passing about the class. With older students, however, or those having had some experience in the use of the instrument, this becomes a less serious objection; and when we consider its general utility, it becomes the most useful of the class microscopes we have seen, though it is clearly not as suitable for class demonstration as that of Mr. Zentmayer. This microscope, however, could also be so constructed as to admit the removal of the milled head after the adjustment is complete, and thus be made to answer the most important indications of the class microscope, while its

Fig. 3.



screw fine adjuster furnishes the most satisfactory means of accommodating differences in vision. The stage is also independent, and provided with spring clips, though more perfect means of securing the

Fig. 4.



object immovably could also be here added. This microscope, as described, and provided also with a wheel of diaphragms, concave mirror with adjustments, double nose-piece to take the two objectives, by means of which the latter can be instantly changed without the trouble of unscrewing, a one-inch objective, a quarter, and a brass lamp, is furnished by Mr. Collins, in a polished pine case, for £4 17s, or, in mahogany case, for £5.

Similar in object is the class microscope of Murray and Heath, London, figured in the sixth edition of Hogg on the Microscope. It consists of the usual microscope body, which can be inclined at any angle, with a mirror on a ball and socket joint; also, a stage plate with universal movement. When to be used as a class microscope, the slide is placed in a shallow box, into which it is locked by a key, which also locks this box firmly on the stage plate, as well capable of being clamped. The focal adjustment being made, the body is locked in its place by the same key, and the final adjustment is made, as in Beale and Zentmayer's instruments, with the eye-piece. The body is then placed horizontally, and fastened with a screw. It is now ready to be passed around the class without possibility of injury to object or object glass. The illumination is obtained, as in Beale's and Zentmayer's instruments, with low powers by holding toward a window, or with medium and higher powers by a lamp properly placed. This microscope would appear, from its description, to accomplish its object well, and has this advantage over that of Collins, in that it has a base on which to stand when arranged for *class* use. We have, however, never seen the stand, and know nothing of its weight or cost.

The so-called "pocket" microscope of Mr. Tolles should, perhaps, be included among class microscopes; but as it admits of use only when directed toward a lamp, or other source of light, its utility as a demonstrating microscope is limited. It consists of a simple tube, six inches long, with a quarter-inch objective and B eye-piece, fine and coarse

adjustments for focus, a stage with clips to hold the object, which can be removed when not in use, and the objective covered with a brass cap. Price, $25; with a draw tube for increasing power, $30.

Perhaps all of these class microscopes could be improved, but we regret that their use has not become sufficiently general, in this country, at least, to justify very much attention on the part of instrument makers, and it is one of the objects of this paper to extend their use by pointing out the advantages arising from it: for we believe this to be the sole method in which the student can be taught the true appearance of minute objects, and when used in conjunction with carefully prepared diagrams, or the gas microscope, will afford the fullest knowledge of such objects. Nor is there any limit to its application, since we have used "an eighth" object glass, with a deep eye-piece, to produce a power of 600 diameters, without any appliances to condense the light, and this with perfect satisfaction before classes of 150 men and upward. Not only this, but we have even used them in lectures, of a somewhat popular character, in which a mixed audience of ladies and gentlemen, numbering over 500, have passed them from one to another, and subsequent inquiry has shown that they have understandingly studied the specimens. Dr. Beale has used a "twelfth" magnifying 700 diameters. Thus we can obtain a range of power, from the lowest to the highest desirable for teaching purposes. This is not possible with the gas microscope, at least with natural objects, though this instrument has recently become quite available in teaching. For, although the latter instrument can be used with great advantage, with comparatively large natural objects and low powers, we have not yet seen a satisfactory exhibition of an object calling for even so low a power as the circulation of the blood in the web of the frog's foot, sufficiently amplified to permit it to be well seen at a distance of more than ten feet, and even such demonstration we confess to have been but little more satisfactory than a good drawing; for although the blood, by this means, is seen to be moving, and the general contour of the object is shown, yet the appearances are far from being as truthful as when studied by the ordinary microscope. Now, the demonstration of the circulation is one of the easiest objects shown by the class microscope, since it requires but a low power, and ordinary diffused daylight is sufficient illumination, so that the lamp may be entirely dispensed with. If it be said that the use of the high powers may be accomplished with the gas microscope and photographs, the photograph, which, at best, gives us but a surface picture, and of but a single layer of structure at the same time, merely takes the place of the diagram, and ordinarily does not resem-

ble the object better than a *well executed* diagram, so that the clinical microscope would be even here necessitated to complete our knowledge of the subject. We do not wish to be understood as underrating the utility of the gas microscope; for, when available, it becomes a most useful adjuvant. But we believe it takes the place, not of the class microscope, but of the ordinary enlarged diagram; and even for this purpose, when we consider that it requires, almost invariably, the aid of a special assistant, and admits ordinarily, but a single picture to be shown at one time, a little thought will suggest many instances in which it will be but an embarrassing aid. It is true, objects may be arranged in groups and then photographed, whereby a set may be thrown upon the screen at one time.

But any one who has had experience in teaching such a subject as physiology, will recall how constantly it becomes necessary to change any order which may have been adopted, or to interpolate a new drawing, so that we are inclined to believe that there will always be a necessity for such means of illustration as are afforded by class microscopes. And even should the ordinary diagram be totally substituted by the gas microscope, the class microscope still remains a useful adjuvant to our means of illustration, and we are confident that those who may be induced to make use of it will find it of growing utility, while the makers will also be encouraged to extend the latter by improvements in construction and facility of use. We wish, also, to have it well understood, that the class microscope is no substitute for diagrams, since it would be impossible to demonstrate points which should be seen by all the members of a class at the same moment, but, as stated, it is in *conjunction* with such aids to teaching as diagrams or the gas microscope, that it becomes most available.

No indifferent reason for cultivating the use of this microscope in teaching, is the fact which we believe well established, that students are themselves stimulated to work with the microscope by a familiarity which they thus acquire with its rudimental working, as well as with the correct and often fascinating appearance of natural objects.

We especially desire to call attention to Mr. Zentmayer's stand as the most available and best for purely clinical purposes, though that of Mr. Collins has, perhaps, a wider utility. Where but a single or two microscopes are desired, however, and where it is more particularly desired to demonstrate, as in teaching physiology or clinical medicine, without occasion for the student himself to practice, Mr. Zentmayer's will be most suitable.

ON PRESERVATION OF THE TEETH.

BY SAMUEL FISHER HOWLAND, D. D. S.

The human body is an organization of matter containing a vital principle or life force; and is so wonderfully constructed, so curiously wrought, and so intricate in all its parts, yet so perfect and harmonious in its action, as to excite in the thinking and contemplative mind, feelings of astonishment and awe; and though science has been diligent in her researches for centuries past, and brought to light much that was hitherto unknown concerning this wonderful piece of mechanism, and of the anatomy and function of its numerous parts, there is yet room for the investigating mind to go still farther in pursuit of this knowledge, and still deeper in the mine of hidden truths, that the world may become more enlightened in self-knowledge, more familiar with the anatomy and physiology of the body we inhabit, and with the laws which govern its action; then will be realized more fully the profound meaning of that saying, "man is fearfully and wonderfully made."

Each constituent part of the body has its appropriate office to perform, and is necessary to the completion of the whole; but if any member fails in the performance of its office, the system is more or less affected or deranged thereby; hence the importance of preserving that even and perfect balance of health, that the various functions of the body may be performed unobstructed, and the harmony of the system be maintained.

Among the many members and organs of the body, one class is of peculiar interest to the student of dental science, and of vital importance to every individual, viz: *the teeth.* These are the principal organs of prehension and mastication, whose office it is to prepare food for the stomach, that its nutrient portion may enter into the substance of the body.

In building a structure, there should be a firm foundation, suitable materials and the requisite appliances, else there will be defects frequently manifest in the work; and the structure will be imperfect and incomplete. For the proper mastication of food good teeth are necessary; without these food must pass into the stomach improperly prepared for the action of the gastric secretions, and for the succeeding processes of digestion, which ultimately end in its nutrient properties being converted into blood, to supply the waste of, and build up the system; hence a portion of material is lost: the blood is deficient in quality and quantity; the body suffers for want of needed supply, and from an undue and unhealthy action of the digestive organs in their effort to perform their proper function; therefore it is of the highest importance that the dental organs should receive that care and attention so essentially necessary to their preservation, that nothing may be wanting in this direction for the healthful promotion of the vital organism.

The temporary teeth are twenty in number, and are developed by the mucous membrane covering the edges of the maxillary arches, commencing at the sixth week of fœtal life; their eruption beginning at the seventh month of childhood, and is complete about the end of the second year—those of the lower jaw preceding those of the upper jaw.

These subserve the purposes of mastication during childhood, and are the forerunners of the permanent teeth to which they give place in due time.

The development of the permanent teeth commences about the fourteenth week of fœtal life; they begin to erupt about the sixth year of age, and are complete at the age of fourteen, excepting the wisdom teeth, which are usually erupted from the seventeenth to the twenty-first year. Each tooth consists of three portions—the crown which projects above the gum, the fang or root, entirely concealed in the alveolar process, and the neck, the constricted portion between the crown and fang.

The roots of the teeth are firmly implanted within the alveoli; the socket is lined with periosteum, a highly vascular membrane, which is reflected on to the tooth at a point of the fang, and covers it as far as the neck. At the margin of the alveolus the periosteum becomes continuous with the fibrous structure of the gums.

In the interior of a tooth is found a hollow cavity, situated at the base of the crown, and is continuous with a canal which traverses the centre of each fang, opening at the apex by a minute orifice. The shape of the cavity corresponds somewhat to that of the tooth, and contains the dental pulp.

The solid portion of the tooth consists of three structures—the dentine, which forms the larger portion of the tooth, the enamel, which covers the crown, and the cementum covering the fang. Dentine differs in structure and chemical composition from osseous tissue. It consists of twenty-eight parts animal and seventy-two parts of earthy matter. The enamel is the hardest portion of the tooth, and consists of ninety-six and five-tenths per cent. of earthy, and three and five-tenths per cent. of animal matter. The cementum, in structure and chemical composition, resembles bone. It contains the lacunæ and canaliculi; and the lamellæ and Haversian canals, peculiar to bone, are found in it to some extent.

The teeth, under certain conditions, and with proper care, will last longer than any other portion of the body. Perfect sets of natural teeth are rare, and to so frightful an extent has disease worked the destruction of these organs, that well may the inquiry be made, what can be done for their preservation?

The teeth, like other tissues of the body, are nourished through the blood by the food we eat, and those kinds of food which contain the material

that enters into the structure of osseous tissue should be taken in sufficient quantity to supply this demand; especially do children need this element, that their teeth may be more fully developed, and to give them the requisite density to resist the action of those agents coming in contact with them, which tend to break down the structure; that they may be preserved till the child reaches adult age, which may be considered as a point of *comparative* safety.

The first thing to do is to learn the causes of the premature destruction and loss of the teeth. In looking back to that period, when the mode of life was very simple, when people labored hard and partook of a plain nutritious diet, the teeth, as a general rule, were better than they now are; luxuries were fewer, and the whole manner of life was far different from the artificial mode of living at the present time; thus man living in a natural condition and following the teachings of nature's laws and his own instincts, tends to the better development of his physical being, than the way a large portion of people now live; hence, we may conclude that an artificial mode of life, sedentary habits, undue mental labor, want of bodily exercise and improper diet, all of which tend to bring the body into an abnormal condition and thus derange the system, are some of the causes which act directly and indirectly to the destruction of the teeth; for their better development and preservation, there must be a radical change in habit and diet, and particularly should the bony element be contained in the food we eat to a good degree. If bread, the staple article of food, was generally made unleavened and of unbolted wheat, a marked change would be observed in the general character of the teeth. Bolted wheat is deprived of just that part which is needed to make bone and build up tooth structure, important parts being given to animals, and mankind suffers the consequences and must pay the penalty.

Condiments generate acid which breaks down the enamel of teeth, then caries begins and carries on its destructive work. Medicines are a predisposing cause of caries, sometimes by direct contact with the teeth, and sometimes indirectly by changing the secretions of the mouth. Improper diet and habits frequently cause dyspepsia which works the destruction of the teeth. Any modification of diet and nutrition will affect the teeth. The use of tobacco causes absorption of the gums and denudation of the fangs of the teeth; inflammation follows till extraction brings relief.

Caries is not fully understood; there are various theories concerning it. The present one is, that it is a vegetable fungous growth, its life depending on moisture.

The enamel of teeth is broken down by mastication, by the extremes of heat and cold and by acid secretions, then the dentine is destroyed by caries. This is the most common way that teeth are destroyed.

Besides constitutional remedies, for the preservation of the teeth, they must be treated directly. The mouth and teeth should be cleansed; all useless teeth and fangs which are uncleanly and a source of irritation and annoyance should be removed, otherwise the breath is contaminated, impure air is taken into the lungs, and the general health thereby impaired. One diseased tooth frequently prevents the use of nearly all the teeth on one side of the mouth, which use is essential to their cleanliness and health, otherwise tartar is deposited on them, the gums and periosteum are irritated and inflamed, and the patient suffers. Teeth are kept in a much healthier condition by use; hence the importance of removing the obstructions which prevent this. They should be carefully and properly cleansed of all foreign matter, then by the daily use of brush and powder, they can be kept in a cleanly condition; by this, and the use of some astringent mouth wash, the gums will become harder, more dense and healthier. All carious matter should be removed from cavities in the teeth, and each filled with the greatest care and thoroughness.

Simply "filling a tooth" is an expression incomplete in its meaning, when is taken into consideration the work to be done. A portion of dental tissue is removed by disease—*it is lost*—a cavity is formed, and the prevailing idea is, it must be *filled*, taken for granted, when this is done, that disease is arrested and the tooth saved, so far as filling can save it; whereas, the reverse may be and often is the case. The grand idea to be kept in mind by every dental practitioner should be, *restoration*. A portion of tooth is *gone*, and, to save the remainder, there must be a perfect restoration of the part lost by artificial means; thin broken enamel should be cut away, all decay removed from, in or about the cavity, the parts prepared for the retention of the filling, and then completely, solidly and perfectly filled with pure gold, and those precautions taken which will insure the tooth against the destructive elements which are continually warring against it.

Filling a tooth is but one of the means of preserving it; though all-important in itself there are other means of preservation which belong to the patient, and, if neglected, will render the work of the dentist, in a measure, fruitless, however thoroughly it may have been done. It is not enough that the mouth and teeth are put in proper order once, as if that was sufficient for a lifetime—care and cleanliness of these must *never* be neglected. The teeth, from the time of their eruption, should be used carefully, watched closely, treated judiciously by their owner, and under the direction of a competent dentist. This requires time, care, attention and pecuniary means, and causes some inconvenience; but these are necessary to their preservation, and are little, comparatively, providing the object is accomplished; this every patient should be taught. It is a *posi-*

tive duty of the dental practitioner to teach and instruct his patients as they need, and so wisely discriminate and judge, that his instructions shall be adapted to the one taught and dispensed, without giving offense or violating the rules of propriety. He should "be all things to all men," that perchance he may save some.

The responsibilities of the dentist are obvious to every faithful practitioner. His work is not wholly a pecuniary one. A new era in our profession is dawning upon the world, and he who participates in its advancement should be governed by honesty, truth and integrity, and be actuated by the highest motives, that the public may be educated to a right appreciation of its advantages, and may we hail the day as not far distant when the value of the natural teeth shall be so highly estimated, and the efforts for their preservation be so richly crowned, that artificial teeth may be the exception, and beautiful teeth of nature's provision become the rule, then will be illustrated one of the highest objects of our mission, viz: *the preservation of the teeth.*

MASS.

VALUABLE FAILURES.

BY J. F. BABCOCK, D. D. S.

And if an interrogator were to inquire what I meant by the above subject, I would answer, any failure properly *appreciated* becomes valuable, and many times, with the conscientious dentist, its experience is even more so than the most brilliant success. Failures imply either error in judgment or a lack of knowledge, and who, in these respects, are perfect? Success, *complete* success, demonstrates the acme of human exertion, in whichever direction it may be achieved; and therefore, in its own peculiar merit, leaving *nothing to learn.* Such successes are indeed precious to ourselves, but especially so to our patients, and it is because of an earnest desire to perform our duty, our *whole* duty, toward *them*, that we strive "with all the strength that in us lies" to reach the highest attainment possible; therefore, to achieve perfect success should ever be, professionally, our highest ambition. It cannot be obtained at once; it is only by constant, untiring study and experience, oftentimes wearisome and discouraging, that those who seek it *sometimes* find it.

Failures of a greater or lesser magnitude will stare us in the face every day, but such failures to the dentist, conscientiously striving to do his duty both toward himself and his patient, will be *valuable;* for they will prove to him wherein he has erred, and eventually lead him into that "straight and narrow way" to a perfect success, however few there be who find it. Without further argument to prove the oftentimes worth of failures, I will proceed to speak of some of my own in the use of that

material commonly known as oxy-chloride of zinc, or os artificial, and although it is not a particularly pleasant matter to publish one's failures, yet "hope's whisperings" counsel me to feel that they may eventually prove to the profession, as they have to me in experience, *valuable*. If so, I shall at least feel that I have performed a duty.

Nearly one year ago, after reading in the various dental journals the different articles, pro and con, and hearing the subject thoroughly discussed in several Association meetings in Philadelphia and elsewhere, I concluded to give the os artificial a fair and impartial trial as the "savior of exposed pulps;" opportunities were not lacking, and in the course of six months I had treated some fifty, (and here I stopped to see the effect,) which, at the time of their presentation, were aching with different degrees of intensity. My first step in the operation was always to excavate as much of the decay as possible, taking particular care to remove any substance which might be acting as the immediate cause of irritation to the pulp, and then for the purpose of reducing the inflammation, I applied creasote upon a pledget of cotton, protecting *this* with cotton and sandarach, allowing the patient to go and return within forty-eight hours, when, if no pain had ensued, it was my practice to remove the evidences of the previous treatment, replacing a new and small pledget of cotton, slightly moistened with creasote, directly and lightly over the exposure of the pulp. I then proceeded to fill with the os artificial, taking care not to press it too tightly upon the point of exposure; the pain following this procedure would vary from slight to intense, and from two minutes to an hour's duration, when it would gradually cease and disappear altogether. I then dismissed the patients, with orders to return any time within two months that best suited their convenience, for the purpose of having the os artificial protected by a complete covering of gold, in order that it might not be washed away through the action of acids in the saliva.

Everything "went merry as a marriage bell," for, in response to inquiries, the answers would be, "not a particle of pain;" "the tooth never felt more comfortable," &c. Took out some of the fillings and replaced them upon finding the pulp alive and apparently healthy. No case that I could find had proved, in the slighest degree, a failure, and I began to hope that the pulp had at last found a "fellow feeling," which was making it "wondrous kind;" but alas, for the fragility of human expectations, the storm has at length broken upon my unprotected head, and *fifteen* out of the fifty have made their appearance, *every single one* burdened with an abscess. How many more there are to come, He alone can tell; but I confidently expect a call from all the rest eventually. None which have so far appeared showed any evidence of future trouble for at least six months after being filled, and most of said cases, especially

those in the superior maxilla, I trust I have succeeded in saving, by treating the abscess with the proper remedies; at all events they have yielded to them, and in all instances are doing well. So much for my experiments with oxy-chloride of zinc. In my hands, and I believe in many others, it has proved *worse* than useless; for had I originally, as is my custom, destroyed the pulp, extracted it, thoroughly cleansed the canal or canals, filled them, and, in fact, *properly* treated the tooth, I should have been saved much time, expense, trouble and vexation of spirit, but therein is my failure *valuable*. Oxy-chloride has its uses in dentistry, many of them important; but in my opinion *not* as a "savior of exposed dental pulps." *Why* not I will endeavor to make clear in some future communication.

BANGOR, MAINE.

ALLEN'S CONTINUOUS GUM WORK.

BY T. HASBROUCK, D. D. S.

There is so little said or written on this subject, that it seems to have been almost entirely neglected of late, not only in the dental schools, but in the columns of the journals. Continuous gum with a platina plate properly put up is, in the opinion of the writer, the most perfect thing in the way of artificial dentures that has ever been produced. This will, no doubt, appear to some as a very broad assertion, on account of their having seen very ugly looking specimens of the work in some mouths, and other objections have been its weight and liability to fracture when dropped. Others, that are not unfrequently urged are, that it is impossible to mend it after it is once broken, and that the plate will warp in baking, and consequently be a misfit when completed. All of these objections would be good ones if they had any foundation in fact, which any man who has a thorough knowledge of the work can easily demonstrate to be untrue.

We have seen a great number of cases of this work that were improperly made, and such coming under the observation of any good dentist, would very naturally give him the impression that, practically, continuous gum work is worthless, unless he happened to know how it *should* be done. There is but one way to do anything, and that is to do it right, and if this work is done in that way, it will be just as strong and durable as any, and much more natural and cleanly than any I have ever yet seen.

The plate, for a practical case, should be about No. 28, by gauge, and the French platina is preferable on account of its being smoother, brighter, and less likely to have cracks and fissures in it than that which is made from scraps and rolled out. The plate should be

swaged in the same manner as an ordinary metal plate, being careful to keep the base metals from it in annealing. Get the articulation the same as in any case, and the teeth can be placed in most any position required. After they are arranged on the wax as desired, it is well to put plaster enough around the outside to hold them firmly in position while being backed and soldered.

Then invest in plaster and asbestos, first putting a stiff platina wire across the heel of the plate to keep it from warping or springing while being baked. The backing should consist of about three separate pieces of platina, and cannot be too stiff or strong; solder with pure gold. It should not be soldered in the furnace, as the teeth will be very likely to be etched and spoiled by overheating while in the investment.

Heat them to a cherry-red in the furnace, and then melt the solder with the blow-pipe. After cooling off remove the investment, taking care to preserve the base with the wire in it to bake the piece on afterward. Put the piece in acid to remove the borax, and then wash thoroughly with soap. The case is then ready for the body. After the first coat, the cracks and fissures caused by the shrinkage must be carefully filled, and it will come out of the furnace the second time smooth and ready for the enamel, which can be put on thick or thin to suit the case, and shaded as desired.

The baking and furnace work is the most difficult part, and can only be learned by practice. There are many little annoyances that the beginner has to put up with, and gasing is perhaps the worst one. If it is heated up too fast it will snap and fly. If the case is gased, it is ruined, and might as well be made over at once. It will look blue, and be rough and spongy. A little practice and instruction from any one who understands it will enable one to overcome all these difficulties. As for the work breaking down easily, it will not do it in the mouth, and is no more likely to fracture than any other, unless dropped on marble or some other hard substance. If a patient has the misfortune to drop and break them, they can be repaired just as easily as any other work, and can be mended to look well, though, generally, after being mended two or three times they are not so strong as at first. The same may be said of almost any work.

To those who are fortunate enough to know how to do this work, this will, of course, be without interest. It is meant for those who do not, of whom, I am well aware, there are a great many in our profession. I do not wish to convey the idea that continuous gum is better than anything else, but have said these few words, hoping that there may be some interest awakened in its behalf, and am very sure that whoever takes it up, masters it, and uses it properly in his practice, will never have reason

to regret it. I would not recommend its use for partial plates, but for entire upper, or under, or both, I think it is without an equal in most cases.

PHILADELPHIA, PA.

AMALGAM.

BY CHARLES H. BAGLEY, D. D. S.

In my school days I had a companion, whose motto was, "putty and paint." When engaged in the execution of any of the numerous projects by which he worked off the superfluity of his boy's energy and nerve force, as, for instance, the building of a boat, his haste and eagerness to accomplish what he had undertaken, left many an open joint and glaring imperfection, which sadly marred the beauty of the finished whole. At such times the boy would cry, "Putty and paint! Putty and paint will cover it all, and no one will know what is beneath." Nobody did know the real state of affairs at first, but the dashing young builder was soon made aware that something was amiss, when, after a few days of hard service, the water worked its way through the open seams in spite of putty and paint, which were intended for show, not use, and the poor boat, becoming rheumatic in the joints, and generally invalid, was laid up in ordinary, a victim to putty and paint. Navigation being thus abruptly closed, and his ardor dampened by the wetting of his feet and a very fluent coryza, the boy would resolve, every time he sneezed, to make haste more slowly in future, and abjure his favorites. His reformation usually lasted until he was ready to build another boat.

It seems to me that many men, who take up dentistry simply as a means of making money, and not as a profession in which they have any pride, are like the boy boat-builder. His only thought was how to fasten the boards together as quickly as possible, give them a respectable outward appearance, and then take a ride. He could not spend the requisite amount of time in acquiring skill in the use of tools, nor for learning what were the best materials and model for his boat. He did not care for the excellence of his work; he only wanted to row in a good-looking boat. The so-called dentists cannot waste two or three years in acquiring professional knowledge and skill, when, in a few weeks, they can learn to scrape out the tooth cavities, and fill them with amalgam putty, to which, with the aid of a burnisher, they give a bright polished appearance, which sends the patient away pleased, while the operators put the money in their pockets and are satisfied with themselves. When the evil effects of this work on their patients and practice become evident, they sometimes repent. The reformation endures until new patients enter the office.

The use of amalgam has done more to lower the average degree of opera-

tive skill in the dental profession than any other cause. This result, however, would be of slight importance if amalgam was a better material than gold or tin for filling teeth. If its color closely resembled that of the teeth; if it was a non-conductor of caloric; if it was unalterable under the influence of the fluids of the mouth; if it exerted a beneficial preservative action on the teeth, with no injurious effects whatever, still retaining its present plasticity, which makes it so much of a favorite; if, I say, amalgam possessed these properties, the skill now considered necessary in him who works with gold and tin would be no longer needed, for a carious tooth could, in that case, be put in better condition without this great skill than it now can be with it. Unfortunately, amalgam has none of the properties enumerated above, except plasticity, but it does possess decidedly objectionable characteristics, and often produces very injurious effects; in fact, it is totally unfit to be used as a material for filling teeth ordinarily, and in certain exceptional cases only is it admissible, as I shall endeavor to show.

All drugs or medicines are poisons to the healthy body, and nature protests and rebels against them, showing that they never should be introduced into the human system except in cases of necessity, or for scientific purposes. Even in sickness, the tendency has been for many years to give less and less medicine, as it has been found that small doses do as much good, and far less harm, than the massive doses of the old heroic practice.

Lord Bacon laid it down as an axiom, that medicines shorten life.

It being true of all medicines, that they should never be needlessly introduced into the system, how very careful should we be in the use of powerfully poisonous agents like mercury. Yet every time that we insert amalgam fillings in the teeth, we incur the risk of poisoning our patients with this drug. The amalgam is placed where the fluids of the mouth can and do come in contact with it constantly. That they can and do act upon it we may infer, from the fact that it frequently becomes discolored, and sometimes porous and friable; from the fact, perhaps, that the tooth becomes discolored, often for a considerable depth, showing the formation of a soluble compound which has been absorbed by the tooth; from the fact that saliva always contains elements which unite readily with mercury when brought in contact with it, and from the fact that these elements are often present in the nascent condition from the decomposition of binary compounds, and are, therefore, in the most favorable condition for acting in concert with any substance for which they have an affinity.

According to Berzelius, as quoted by Dr. Piggot, in 1,000 parts of saliva, there were found—

Water,	992.9
Ptyalin,	2.9
Mucus,	1.4
Extract of flesh and alkaline lactates,	.9
Chloride of sodium,	1.7
Soda,	.2
	1,000.0

The water, of course, contains oxygen, and the saliva has the property of absorbing great quantities of this element, of which there is always an abundant supply in the atmosphere.

Berzelius also found in nasal mucus—

Water,	930.7
Mucin,	53.3
Alcohol extract and alkaline lactates,	3.0
Chlorides of sodium and potassium,	5.6
Water extract, with traces of albumen and phosphates,	3.5
Soda, combined with mucus,	3.9
	1,000.0

No close analysis of buccal mucus has been made, owing to the difficulty of obtaining it pure; but as pulmonary and other mucus contain nearly the same constituents as nasal, we may consider that this analysis represents that of buccal mucus also.

On examining this saliva and mucus, we find in them water, furnishing oxygen and hydrogen; the chlorides of sodium and potassium, furnishing chlorine; and albumen, furnishing sulphur, with which it is usually combined. Of this combination a common illustration is seen in the rapid discoloration of silver spoons when brought in contact with eggs; the sulphur in the albumen of the eggs being the discoloring agent. Any one of these agents, except hydrogen, is capable of acting on mercury, tin and silver.

The galvanic currents set in motion by the unequal action of the saliva on the different metals in the amalgam, or on the amalgam and gold, when both are present in the mouth, can decompose the saliva, and then we have the oxygen, chlorine and sulphur in the nascent condition, and ready for work.

As I mentioned before, amalgam fillings, and the teeth filled, are frequently colored dark or black after the amalgam has been in the mouth for some time.

The oxide of silver, AgO, is black, slightly soluble in water, and forms decidedly poisonous colorless salts, with acids, of which there are often some present in the mouth.

The suboxide of mercury, Hg_2O, is "brownish-black, decomposing by light and warmth into oxygen and the metal." It is quite active as a

poison, but is, fortunately, not very soluble, and by its deposition on the surface of the amalgam, may retard, and sometimes even stop, chemical action on the filling.

The protoxide of tin is also black, but is not apt to be formed as oxygen has not so strong an affinity for tin as for silver or mercury. This is also the case with sulphur and tin, and I shall, therefore, not take into account the action of tin.

Sulphur has so strong an affinity for silver, that sulphuret of silver, AgS, "is spontaneously formed whenever silver is brought in contact with a sulphuret, either gaseous or liquid. So strong is the affinity of this metal and sulphur, that it has been used as a convenient test for the presence of sulphuric acid." Sulphuret of silver is dark brown, and is nearly insoluble in water.

The subsulphuret of mercury is black, and not very soluble. It is not so active in its effects on the system as the black oxide of mercury, but is still able to produce a decided impression. These compounds, any one of which may be formed when amalgam is in the mouth, are sufficient to account for the discoloration of the fillings, and by the solubility, although slight, which they possess, may be partially explained by the discoloration of the tooth, it having absorbed the solution.

Last, but not least, chlorine is present, watching eagerly for a chance for a raid in the enemy's country, and unless the out-posts are guarded by a picket of insoluble sulphuret, he will surely get possession, and then will be formed the subchloride of mercury, Hg_2. Cl., calomel, or the chloride of mercury, Hg. Cl., corrosive sublimate. Think of calomel or corrosive sublimate being absorbed into a man's system, slowly, but steadily, for six or eight years! The bare idea is enough to make one's mouth water.

The presence in the mouth of any of the compounds I have enumerated must be deleterious to the health; for, as I have said, the oxide of silver readily forms poisonous soluble salts, with nitric and other acids often present in the mouth. The suboxide of mercury is easily decomposed by light and warmth into oxygen and the metal mercury, (the latter is soluble in the buccal fluids,) "and gives up its oxygen to deoxidating agents generally." In contact with hydrochloric acid, which may be found in many mouths, it is readily decomposed, "the reaction yielding water and the subchloride of mercury or calomel." The subchloride of mercury is well known to be an active and powerful drug, while chloride of mercury, or corrosive sublimate, is an intensely corrosive poison.

The effects of mercury on the system are well known; but Dr. Piggot gives so excellent and concise a summary of them, that I shall quote him:

"The ordinary alterative action of this metal, when administered in properly regulated doses, is attended by no especial disturbance of the system. But at times it does not act upon the economy with such tranquility. A febrile condition is not uncommon. At such times the surface becomes warm, the circulation accelerated, the pulse is frequent and jerking, the face is slightly flushed, the nervous impressibility is heightened; in short, there is a general excitement of all the functions. The glandular system is especially acted on; the liver secretes more bile, the salivary glands eliminate more saliva, and in this, as well as in the green discharges from the bowels, the metal may be detected. When mercury is about to spend its force upon the glands of the mouth, the earliest indication of its action is an unpleasant metallic taste, like that of copper or brass. Presently the gums become sore and tender, the mucous membrane is inflamed, the teeth suffer with disagreeable sensations, which are referred to the fangs, and these are raised to actual pain when the jaws are firmly closed. Presently the gums swell and become spongy, then a whitish line is seen along the edge of the teeth, and the peculiar mercurial fetor is developed. The salivary glands are swollen and hot, the jaws stiff and painful. After this condition of things has lasted a short time, a copious flow of saliva takes place. The disease does not always stop here. The cheek is puffed out with a red swelling, which gradually becomes more and more livid, till a gangrene sets in, which sweeps it away, slough after slough laying bare the cavity of the mouth, and hurrying the unhappy sufferer to the grave. Sometimes the ulcerations attack the gums, break them down, seize upon the periosteum, penetrate the bone, which becomes carious and spongy, and finally exfoliates, leaving the most hideous gaps in the face. At other times this ulceration, or gangrene, extends among the soft parts, and opens the blood-vessels, giving rise to the most destructive hemorrhage.

"Nor is its influence confined to the cavity of the mouth. With or without salivation, it exerts the most baneful influence over the economy. At times it acts as a powerful and dangerous sedative. The countenance becomes pale and anxious, the pulse small and frequent. There is much anxiety about the præcordia, and extreme and alarming prostration of strength. At other times an eruption breaks out over the surface, which has been called *hydrargyra eczema mercuriale* and *lepra mercurialis*.

"The most distressing effects it produces, however, are the affections of the nervous system. *These are especially experienced by those who contract the poison by slow and gradual absorption of the metal.* One of the most frequent of these disorders is a form of *paralysis agitans*. The tremors of the limbs are so considerable that the patient is unable to walk without staggering, or to hold anything in his hand. He stammers and finds it

extremely difficult to speak at all. His memory fails him, his intellect becomes weak, and his sight is dimmed. Such phenomena as these are constantly met with among gilders, looking glass makers and workers in quicksilver mines.

"So virulent a poison as this should never, except in cases of the sternest necessity, be introduced into the system, and then it should be done with the greatest care, and so managed that its absorption may be controlled, or that the quantity to be taken in may be regulated. How are these conditions fulfilled when amalgam is introduced into a tooth? Not at all. The secretions of the mouth float around the metal and act upon it. An important part is also played by the other constituents of the filling, which, together with the mercury, form a galvanic apparatus, greatly accelerating the solution of this metal.

"The amalgam question, as it has been called, is thus answered with the utmost promptitude by chemistry. To the chemist it has but one side; it needs but to be stated to be immediately decided upon. The use of a mercurial amalgam is, under all circumstances, wrong; for the simple reason that we have no guarantee that the most frightful results of mercurial poisoning will not take place. * * * That the metal itself is capable of producing these symptoms is a matter of such common place notoriety that the veriest tyro is familiar with it."

I admit that we do not often see cases of severe mercurial poisoning caused by amalgam fillings, but they have occurred, nevertheless, and we cannot know that they will not occur in our patients, for it is a well-established fact, that some persons are peculiarly sensitive to the action of some drugs, so that it is frequently necessary to take into consideration these idiosyncracies when exhibiting medicines. I know a lady who cannot endure the most minute portion of arsenic in a tooth cavity, it producing violent symptoms. Dr. Watt mentions the case of a lady in whom two grains of calomel caused, in a few hours, ptyalism, "in consequence of which she lost her teeth, her jaw exfoliated, and she ultimately, after a succession of ailments, died in about two years."

Taylor's Medical Jurisprudence, article Mercury, says: "Another case was mentioned to me by a pupil, in 1839, in which five grains of calomel killed an adult by producing fatal salivation. In another instance, a little girl, aged five years, took daily, for three days, three grains of mercury and chalk powder; her mouth was severely affected, mortification ensued, and she died in eight days."

These extracts show that the ill effects which sometimes follow immediately from an ordinary dose of mercurial medicine are extreme, even to the taking away of life. It will be readily understood that every less degree of mischief must happen frequently.

The fact that the absorption takes place slowly constitutes the great danger, for it is well known that diseases caused in this way are the most intractible under treatment, and, moreover, the system is attacked so insidiously that the baneful effects are produced before the existence of the danger is known; whereas, if large doses had been given, the *vis naturæ* would have been aroused at once to expel the intruder.

The terrible and obstinate diseases contracted by painters and metal-workers, especially those who have much to do with quicksilver, are brought on in this slow and almost imperceptible manner. If it be objected that the quantity of the poison is so small that it is an absurdity to suppose that serious results can follow its introduction, I think it can be shown that this is not true. It is well known that the majority of homœopathic physicians, a well educated and intelligent class of men, give medicines in quantities so minute that we may almost consider them infinitesimal, and yet appreciable results are produced. I have seen these results follow the administration of the medicine so quickly and so often, that I had no hesitation in referring them to the remedies and not to coincidence. A grain of what is called by homœopathists the third trituration, or attenuation, seems to be an exceedingly small dose, and yet the particles of arsenic in this preparation are shown by the microscope to be as large as the blood corpuscles, and will respond to chemical tests. Statistics show the average success of homœopathists to be equal to that of allopathists, and sometimes greater, as in some of the cholera epidemics. And where is the absurdity of this? We know nothing of the *modus operandi* of medicines; we can only observe the facts and accept the results.

> "What is the cause of health? and the gendering of disease?
> Why should arsenic kill? And whence is the potency of antidotes?
> Behold a morsel—eat and die; the term of thy probation is expired.
> Behold a potion—drink and be alive; the limit of thy trial is enlarged."

Is the action of minute portions of medicine more absurd than the force of gravity? "No fact is better established than that the moon is kept in its orbit round the earth, and the earth in its orbit round the sun, by the same force as that which causes a stone or an apple to fall to the ground. These bodies are separated by immense distances; how can they act upon each other? How is it possible for an inert lump of matter to influence another inert lump of matter a hundred millions of miles off? It is by the force of gravitation. But what is gravity, and how does it act? We know not."

Think of the effect of light on the retina of the eye, produced, according to one theory, by minute particles of matter striking directly on the eye, and according to another, by the mere undulatory motion of particles so small that the most powerful microscope cannot reveal their forms to our

vision, while "the length of the undulations of the extreme violet ray is 0.0000167 of an inch, and the number of undulations in a second is 727,000,000,000,000.

A grain of musk may be exposed to the air for very many years, constantly giving forth its fragrant particles, readily perceived by the sense of smell, and yet, at the end of this period, the most delicate balance will fail to detect any diminution of weight. Here is a decided effect produced on the olfactory nerves by particles certainly as nearly infinitesimal as those of the medicine we are considering.

Whose vision is keen enough to perceive the malarious particles which cause intermittent fever, or the tiny atoms which convey an infectious disease from one person to another? No microscope can make them apparent; no chemical test can detect them; yet no one doubts their existence. Their effects cannot be mistaken. The smallest portion of poison from the fangs of some serpents inserted into the skin of an animal will cause almost instant death. I have seen accounts of persons who were severely affected by very minute particles of ipecacuanha. One man, a druggist, after narrating the violent symptoms induced in him, says: "At length I was obliged to quit the shop when ipecacuanha was on hand; indeed, I have frequently entered my own, or the shop of a stranger, long after it had been used, and by the instant recurrence of these very distressing sensations, have been able, too accurately, to ascertain the recent exposure of the drug." Another case was that of a lady, who was always seized with asthma whenever ipecacuanha root was being pounded in the shop. Even if she was in the most remote part of the house, the effects were almost immediately felt, and the paroxysm lasted many hours. The wife of a medical man, being near her husband when he was putting some ipecacuanha into a bottle, had so violent an attack of asthma that she nearly lost her life. She was affected with stricture about the throat and chest, with very troublesome shortness of breathing and wheezing, gasping for breath, deathy paleness, almost imperceptible pulse, and great danger of suffocation. She became easier from about 11 A. M. till about 11 P. M. The same scene was continued eight days and nights successively.

1 think I have shown that some persons are remarkably sensitive to the action of some drugs, mercury among the number; that there is peculiar danger in the slow and long-continued absorption of poisons; that very minute portions of medicine may produce very serious results, and that this being the case, an amalgam filling is a thing "most intolerable, and not to be endured." If I have not made this clear, I think it must be because there is nothing which cannot, by an ill way of telling it, be made to appear evil.

With this view of the matter, what right have we to place amalgam in

the mouth of any one? None at all. We have no guarantee that very serious results will not follow. We are tampering with the health of our patients, and that we have no right to do; as on a man's health depends perhaps the happiness, certainly the comfort of his life. Iago might have said of his health as he did of his reputation: "Who steals my purse, steals trash; but he that filches from me my good name, robs me of that which not enriches him, and makes me poor indeed." Amalgam steals away not only the health of patients, but the reputation of many a dentist. Health is, indeed, a jewel, a pearl without price, a possession of inestimable value, whose presence may make a paradise of earth, whose loss may make the world seem hell and mankind devils. Certainly, the unfortunate sick man often acts as if possessed by a fiend, although I do not agree with Carlyle, I think it is, who asserts that all invalids are rascals, or something to that effect. Yet on health depends not only the well-being of individuals, but even the prosperity of nations.

Health, eldest born of all
The blessed ones that be,
Through life's remainder, howe'er small,
Still may I dwell with thee!
And thou with me,
A willing guest,
Oh, take thy rest!
For all man hath on earth, blest health—
Each nobler gift, as children, wealth,
The bliss of kingly government,
With that desiring uncontent,
We fain would seek, we fain would move
In th' undiscovered toils of love;
These, or each other utmost pleasure
Man hath from heaven his dearest treasure,
And amid all his earthly moil,
The sweet forgetfulness of toil;
With thee, blest health, health ever young!
With thee they grew, from thee they sprung;
Spring of all gifts from heaven that fall,
Thou art the sunshine of them all!
Yet all are turned to misery
For him that lives bereft of thee.

(TO BE CONTINUED.)

ON PRESERVATION OF THE DENTAL PULP.

BY DR. ARTHUR FORD.

I have been much interested in reading the proceedings of the Pennsylvania Association of Dental Surgeons, in the January number of the DENTAL TIMES, especially the discussions and experiences in regard to the application of "oxychloride of zinc" for capping exposed nerves. I have used this capping extensively myself during the past two years, and will give my experience with regard to my success.

I would premise by saying that I am a great advocate for preserving the vitality of every tooth wherein I have a shadow of a chance to be successful; but until the introduction of the use of oxychloride of zinc, I must confess I had but ill success, but since, I have been remarkably for-

tunate; indeed, out of many cases, I know of but one that failed, and that was under very disadvantageous circumstances. I do not know whether my manner of manipulating may be the same as most others, so will give it somewhat "in extenso."

First, I excavate the cavity perfectly, taking care not to touch the exposed nerve more than possible, then dry the cavity as much as practicable, without producing too great pain to the patient, and protect the tooth against all moisture; moisten a small mop of cotton with creasote, and wipe out the cavity carefully, but thoroughly, and having previously placed the chloride and muriate of zinc (separately) on a piece of glass on my stand ready, mix them to the consistency of putty, (or nearly so,) keep the mouth open with the left hand, guarding the cavity most jealously against moisture. I then fill the entire cavity, and still keep the mouth open some five to ten minutes; then warming some wax, cover the filling entirely with it, the object of which is to keep the oxychloride as long as possible from becoming very wet, and dismiss my patient for a week or two, at the expiration of which time I remove about two-thirds of the oxychloride, filling thoroughly with gold, or, in some molar cases, amalgam. This has been my uniform mode of treatment in such cases, and am happy to say have been eminently successful. I have three special cases under my eye for constant inspection, one filled about eighteen months since, another about a year, and the third about a month, none of which have given the least trouble since the introduction of the oxychloride, at which time there was, of course, some pain, though of short duration, nor can I discover any indication of decreased vitality. I am so well satisfied with this mode of treatment, that I firmly believe it is the only true way in which a pulp can be capped with any certainty of success.

I perceive also in the proceedings of said Association, that Dr. Huey asks the members for instruction with regard to a "pulp that resisted all attempts to destroy it by arsenical paste." My impression in such cases is, that the pulp is already partially devitalized, and, as a sequence, the absorbents inert, and therefore the energies of the parts are entirely paralyzed. In such cases first remove all the devitalized portion of pulp, or as much as possible without inciting too much pain to the patient, and then apply the paste, and I have never found a case that resisted such treatment. My partner had a case in point lately: he had made five or six ineffectual applications, when one day, during his absence, the patient happened in, and I examined the case. It was the left inferior first molar. I removed all the carious dentine, and nearly the whole of the pulp, without pain, but beyond that point the pulp was of full vitality. I then applied the paste, and in twelve hours after it was

effectually destroyed; that is, to within about a line of the apex of the fang. The tooth was then treated and filled in the usual way, without further trouble.

I do not know that I have advanced any new idea or mode of treatment; on the first subject I only desire to add my evidences of success and approbation of the system of treatment to those expressed by the eminent gentlemen of the Association; and on the latter, seeing no mode of operation promulgated, I humbly offered mine in lieu of a better.

ATLANTA, GEORGIA.

Dental Associations.

THE FOURTEENTH ANNUAL COMMENCEMENT OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Fourteenth Annual Commencement of this College was held on Saturday evening, February 26th, and, as usual, a very large audience assembled to witness the interesting exercises—many obtaining standing room only. The pleasure of those present was much increased by the performance of choice selections of music by the Germania Orchestra.

The opening prayer was offered by the Rev. Dr. Bomberger, after which the Degree of Doctor of Dental Surgery was conferred upon the following members of the class, by Henry C. Carey, President of the Board of Trustees:

GRADUATES, 1869–'70.

J. Fred. Babcock, Maine,.....Morbid Effects of First Dentition.
Charles H. Bagley, Pa.,.....Amalgam.
Edward F. Barnes, Mass.,.....The Dental Pulp.
Henry E. Beach, Va.,.....Inflammation.
Francisco E. Brunet, Cuba,.....Stomatitis.
George T. Carpenter, Ill.,.....Caries of the Human Teeth.
Charles P. Coffee, Ohio.....Dental Caries and their Treatment.
Frank L. De Gour, Pa.,.....Science and Medical Culture.
E. Rubio y Diaz, M. D., Cuba,...Influence of Syphilis upon Diseases of the Mouth.
Charles E. Edwards, Pa.,.....Caries.
Thomas H. Gilpin, Md.,.....Development of the Teeth.
Augustus V. Hartlevan, Pa.,.....Vulcanite Base.
Ferdinand Hasbrouck, Pa.,.....Nitrous Oxide.
John Hellings, Pa.,.....Cleft Palate.
W. H. I. Hilliard, N. J.,.....Disease of Maxillary Sinus.
Louis G. Houard, Cuba,.....The Affections of Superior Maxillary Bone.
Samuel F. Howland, Mass.,.....Preservation of the Teeth.
Jay H. Johnston, Pa.,.....Extraction of Human Teeth.
George W. Klump, Pa.,.....Facial Neuralgia.
O. L. de Lalande, M.D., France,...Mercurial Stomatitis.
Jonathan T. Leet, Pa.,.....Caries of Human Teeth.
William A. Marler, N. C.,.....The Dental Profession.
J. Henry Mease, Pa.,.....Fracture.
Charles W. Meloney, Del.,.....Digestion.
Gustavus J. R. Miller, Pa.,.....Operative Dentistry.
Jose M. Portuondo, Cuba,.....Affections of the Gums.

Alfred Reaud, France,.....Sketches on Dentistry.
Augustus J. Rederich, Iowa,.....Treatment and Filling over Exposed Pulps.
Granville L. Robb, Pa.,.....Antrum of Highmore and its Diseases.
Charles H. Scott, Ohio,.....Dental Prosthesis.
John Sheldon, N. Y.,.....Dental Hygiene.
Melville C. Sim, Ohio,.....Neuralgia.
George W. Smith, Pa.,.....Operative Dentistry.
James G. Templeton, Pa.,.....Operative Dentistry.
James T. Turner, Md.,.....Extraction.
Charles Tyson, Pa.,.....Mechanism of the Human Skeleton.
John D. Ware, N. J.,.....Dental Caries and their Treatment.
M. Milnor Worrall, Pa.,.....Nitrous Oxide.
*Seneca B. Brown,.....Indiana.
*H. H. Martin,.....Pennsylvania.
*J. B. Prescott,.....New Hampshire.
Total,..... 41

The following is a list of the matriculants for the present session, comprising, in all, eighty-three students:

MATRICULANTS—FOURTEENTH ANNUAL SESSION, 1869-'70.

MATRICULANTS.	RESIDENCE.	PRECEPTORS.
A. B. Abell, Jr.,	Pennsylvania,	Dr. A. M. Asay.
William B. Antrim,	Pennsylvania,	Dr. S. K. Screven.
J. Fred. Babcock,	Maine,	Dr. E. T. Wasgatt.
Charles H. Bagley,	Pennsylvania,	Dr. A. B. Robbins.
E. F. Barnes,	Massachusetts,	Dr. A. F. Davenport.
J. C. Barnum,	New York,	Dr. Barnum.
Henry E. Beach,	Virginia,	Dr. T. N. Reid.
Eligio Brunet,	Cuba,	
Seneca B. Brown,	Indiana,	
Eduardo Brunet,	Cuba,	Dr. G. T. Barker.
H. W. Buchanan,	Pennsylvania,	Dr. E. J. Greene.
Frank E. Brunet,	Cuba,	Dr. G. T. Barker.
Charles C. Cannon,	Massachusetts,	
George T. Carpenter,	Illinois,	Dr. B. M. Baker.
Charles E. Caufman,	Pennsylvania,	Dr. C. Sheafer.
C. P. Coffee,	Ohio,	Dr. J. C. Whinery.
Joseph Coombs,	Pennsylvania,	Dr. S. W. Merrick.
Edmund Coquard,	Michigan,	Dr. Cowie.
F. L. De Gour,	Pennsylvania,	Dr. J. Truman.
O. Labadie De Lalande, M.D.,	France,	Dr. O'Callaghan.
T. W. Dobbins,	New Jersey,	Dr. C. S. Stockton.
Charles E. Edwards,	Pennsylvania,	Dr. Wm. Eastlack.
George R. England,	Pennsylvania,	Dr. D. Roberts.
Pedro F. Fernandez,	Cuba,	
Jose Garcia,	Porto Rico,	
Joseph H. Graham,	Pennsylvania,	Dr. T. L. Buckingham.
J. Q. Garset,	Cuba,	Dr. John.
H. C. Gilchrest,	New York,	Dr. George Wright.
Thomas H. Gilpin,	Maryland,	Dr. T. H. Musgrove.
A. V. Hartlevan,	Pennsylvania,	Dr. J. M. Davis.
F. Hasbrouck,	Pennsylvania,	Dr. John Allen.
John Hellings,	Pennsylvania,	Dr. McFarlan.
W. H. I. Hilliard,	New Jersey,	Dr. C. S. Stockton.
L. G. Houard,	Cuba,	Dr. Barker.
S. F. Howland,	Massachusetts,	Dr. A. A. Howland.
H. Hudson,	Pennsylvania,	Dr. Belknap.
E. T. Hutchinson,	Illinois,	Dr. E. Stevens.

*Having been in practice since 1852, and complied with 2d Article on "Qualifications for Graduates."

MATRICULANTS.	RESIDENCE.	PRECEPTORS.
J. R. Jackson,	Delaware,	Dr. G. Spencer.
J. H. Johnston,	Pennsylvania,	Dr. Yost.
S. A. Keltner,	Ohio,	Dr. J. Carr.
G. W. Klump,	Pennsylvania,	Dr. L. Eveland.
J. T. Leet,	Pennsylvania,	Dr. J. Rohrer.
E. H. Leffler,	Pennsylvania,	Dr. S. H. Whitmer.
Arthur Legorburu,	Cuba,	Dr. L. J. Martin.
A. Lezama,	Cuba,	
Clarence L. Lindsley,	Michigan,	Dr. T. Parkman.
Thomas Linn,	Pennsylvania,	Dr. G. Rauch.
W. A. Marler,	North Carolina,	Dr. J. W. Hunter.
H. H. Martin,	Pennsylvania,	
J. H. Mease,	Pennsylvania,	Dr. S. H. Gilford.
Charles W. Meloney,	Delaware,	Dr. W. G. A. Bonville.
G. J. Miller,	Pennsylvania,	Dr. John Heiss.
S. M. Moore,	Pennsylvania,	Dr. G. T. Barker.
G. B. Newland,	Pennsylvania,	Dr. W. Newland.
Robert F. Philips,	Florida,	Dr. Asa Hill.
J. B. Prescott,	New Hampshire,	Dr. T. Buckminster.
Jose M. Portuondo,	Cuba,	Dr. J. Truman.
John W. Ramsden,	Pennsylvania,	
Alfred Reaud,	France,	Dr. O'Callaghan.
C. I. Reese,	Pennsylvania,	Dr. R. McKissick.
A. J. Rederich,	Iowa,	Dr. M. L. Pierce.
G. A. Reid,	Ontario,	
G. L. Robb,	Pennsylvania,	Dr. R. A. Miller.
Enrique Rubio, M. D.,	Cuba,	Dr. O'Callaghan.
Charles H. Scott,	Ohio,	Dr. H. Morrison.
John Sheldon,	New York,	
H. R. Sheldon,	New York,	Dr. John Sheldon.
M. C. Sim,	Ohio,	Dr. M. Keyser.
G. W. Smith,	Pennsylvania,	Dr. J. G. Camp.
M. C. Steeves,	New Brunswick,	J. E. Griffith.
L. A. Stephenson,	Mississippi,	Dr. B. W. Ross.
A. M. Stewart,	Pennsylvania,	
James M. Stewart,	Pennsylvania,	Dr. M. Logan.
J. G. Templeton,	Pennsylvania,	
R. F. Tull,	Maryland,	Dr. Thos. H. Musgrove.
J. T. Turner,	Pennsylvania,	A. P. Fields.
Charles Tyson,	Pennsylvania,	Dr. J. Truman.
J. V. Valdes,	Cuba,	
John D. Ware,	New Jersey,	Dr. E. Chew.
W. R. White,	Pennsylvania,	Dr. W. R. White.
M. M. Worrall,	Pennsylvania,	Dr. E. Penn Worrall.
James Wright,	Pennsylvania,	
S. Zimmerman,	Canada,	Dr. J. Zimmerman.

The reports of both the Operative and Mechanical Departments are also presented. A careful consideration of these reports, exhibiting the amount of work *performed entirely by the students*, must convince every one of the immense advantage of collegiate and clinical instruction.

DEMONSTRATOR'S REPORT, SESSION OF 1869–'70.

OPERATIVE DEPARTMENT.

Number of Patients visiting the Clinic,	3347
Gold Fillings,	1361
Tin Fillings,	669

Amalgam Fillings,	54
Wood's Metal Fillings,	4
Hill's Stopping,	120
Oxy-Chloride of Zinc,	81
Superficial Caries Removed,	57
Treatment of Pulp and Filling Pulp Cavities,	339
" Periodontitis,	35
" Alveolar Abscess,	72
" Inflammation of Gums,	43
" Partial Necrosis of Bone,	5
Bleaching Teeth,	3
Removal of Salivary Calculi,	224
Pivot Teeth Inserted,	5
Extraction of Teeth and Roots,	3692
Total,	6764

ELIHU R. PETTIT, Demonstrator.

MECHANICAL DEPARTMENT.

124 patients were supplied with the following Artificial Dentures;

Full Upper and Under Sets,	33
Full Upper Sets,	47
Full Under Sets,	8
Partial Upper Sets,	37
Partial Lower Sets,	5
Obturator,	1
Teeth Mounted on Silver Base,	1019
" " Weston's Metal Base,	56
" " Hard Rubber Base,	912
" " Continuous Gum,	14
Whole number of Gum Teeth inserted,	1824
" " Plain " "	177
" " Teeth Mounted for Patients,	2001

DEPOSITING CASES.

27 Full Upper Sets on Metal Base, number of Teeth,	378
1 Full Under Set on " " " "	14
4 Partial Upper Sets, " " " "	30
4 Full Upper Sets on Hard Rubber Base, number of Teeth,	56
2 Partial Sets on " " " "	9
2 Full Upper Sets on Continuous Gum, " "	28
1 Full Set on Porcelain Base, " "	14
2 Obturators.	
Number of Gum Teeth,	529
Number of Teeth on Depositing Cases,	529
Total number of Teeth Mounted during Session,	2530

J. M. BARSTOW, Demonstrator.

The Valedictory Address was delivered by James Truman, D. D. S., Professor of Dental Histology and Operative Dentistry, and was listened to with marked attention. This was followed by the distribution of bouquets to the graduates, who seemed to appreciate fully the favor of their lady friends as expressed in those beautiful gifts. The exercises closed with the benediction.

Editorial.

THE CAUSE OF THE DELAY.

In consequence of certain changes in the Faculty of our College, and consequently in the editorship of this journal, it became necessary to withhold the publication of the April number of the DENTAL TIMES until the present time. The changes to which we refer are as follows: Prof. William S. Forbes resigns the chair of anatomy and surgery, and F. Ewing Mears, M. D., has been appointed to succeed him. The last named gentleman is well known as a lecturer and teacher, and brings to the chair a well furnished mind, with no lack of industry and energy. We are also pleased to announce the election of James Tyson, M. D., to the vacant chair of physiology, formerly filled by Henry Hartshorne, M. D. The unequalled success of Dr. Tyson as a teacher and microscopist is well known to our late class who had the past session the benefit of his lectures. We believe these changes will conduce to the best interests of the dental students in attendance, and to the prosperity and welfare of the College.

G. T. B.

☞ Our next number will contain a full account of the formation of the Association of the Alumni of the Pennsylvania College of Dental Surgery, of which Prof. James Truman is President, Dr. E. R. Pettit, Secretary.

DELAYED ARTICLES.—In consequence of a press of matter, several articles are necessarily delayed until the July number.

Correspondence.

THE STATE DENTAL SOCIETY.

The State Dental Society, of Pennsylvania, will hold its second annual meeting, in the City of Pittsburg, on the third Tuesday of June, (21st inst.,) to continue three days.

All necessary arrangements have been made by the Executive Committee, for the comfort and accommodation of the members and delegates at the *Monongahela House*. It is hoped that there will be a full attendance, as the members of the profession of Pittsburg extend a cordial greeting to the members and delegates of the State Society, and are anxious and willing to do all in their power for their entertainment and comfort.

Arrangements will also be made with the railroad companies, leading to that city, to have the fare reduced to excursion rates.

The subjects of the essays for discussion have not yet been communicated to the undersigned; but notice of the same will be given in due time in the dental periodicals. S. WELCHENS, D. D. S., Cor. Sec.,
Lancaster, Pa.

Book Notices.

The Cell Doctrine, its History and Present State, for the use of Students in Medicine and Dentistry. Also, a Copious Bibliography of the Subject. By JAMES TYSON, M. D., Lecturer on Microscopy in the University of Pennsylvania, and on Physiology in the Pennsylvania College of Dental Surgery, Fellow of the College of Physicians of Philadelphia, &c. Lindsay & Blakiston, Philadelphia.

Since the issue of Dr. Beale's work, on "The Structure of the Simple Tissues of the Human Body," in 1861, so much interest has been manifested in the subject by our leading educators, and so many inquiries have been received for a volume adapted to the ordinary purposes of class instruction in our colleges, that the author has prepared this creditable work to answer that demand. He modestly tells us in his preface, that he "has become convinced, by several years' intercourse with students of medicine, that their acquaintance with the subjects he has endeavored to include in this little volume would be facilitated if the views which are now taught and scattered throughout the often expensive works of their authors were collected in a convenient form for study and reference. Taking it for granted that a knowledge of this subject is of fundamental importance in its bearing upon the study of physiology and pathology, he has sought to obtain a continuous history of the evolution of the "Cell Doctrine," up to its present state, without embarrassing his pages with a large number of isolated facts. He has attempted, however, to secure a completeness, and to make the work useful to physicians and others engaged in research, by careful references and the addition of a bibliography, which he has sought to make accurate and extended." The author, in the preliminary chapter of his work, refers to the early ideas of the minute structures of animals and vegetables, and shows how the introduction of the compound microscope influenced and developed histological research. The labors of Borellus, Swammerdam, Malpighi, Hooke and Leeuwenhoek are adverted to, while to Haller is the credit given of conceiving that tissues are built by an ultimate physical element, corresponding with the "atom" of the inorganic chemist. The doctrines of

Wolfe, Prochaska, Bauer and Milne Edwards, and their cotemporaries, receive appropriate mention, and the author carries us on to the "master stroke, in observation and generalization," viz: the observations of Schleiden and Schwann. The investigations of these histologists are noticed in an extended manner, their views fully elaborated, and the influence which their investigations had upon succeeding observers is ably demonstrated.

The above remarks will hold good upon the review of the labors of Barry, 1840; Henle, 1841; Goodsir, 1845; Huxley, 1853; Bennett, 1855; Todd and Bowman, 1856; Virchow, 1858: Max Schultze, 1861; and Dr. Beale, 1861. In the resume of the works of each of the above named authors, the writer proves to be possessed of that rare gift of selecting the very *essential portions* of their labors, and of collating and presenting them to the reader in a brief and concise manner. The whole work, indeed, bears evidence of laborious investigation, and of careful and severe study, while the numerous foot notes and copious bibliography make it of real value to the student and investigator. We give the author's views, which we commend for clearness and brevity.

As the result of a careful comparison of the views of other observers, and of personal observation, extending over a period of several years, chiefly in the direction of human physiology and pathology, the author has been led to adopt views, which, in the main, correspond with those of Dr. Beale. There are, however, a few points of difference; some, perhaps, purely in mode of expression, but others as to matter of fact, which would seem to be appropriately here recorded. And, in order to give completeness to any expression of such views, he has thought best to state them connectedly, though briefly.

The author believes the ultimate physical element of organization, to be what is commonly called the "cell," or "elementary part," and that it is composed of matter in two states. The one, central in its situation, to which Dr. Beale has most appropriately given the name "germinal matter;" the other, for the most part peripheral in its situation, which the same observer has called "formed matter." The former, which is the "sarcode" of Dujardin, the "protoplasm" of Max Schultze, is that upon which the *origin* and *existence* of the cells depends. It is derived by division, budding or proliferation from previously existing matter of the same kind, and it alone has the power of growing by converting nutritious matter or "pabulum," derived from the blood or other sources, into material like itself. Without germinal matter, textures cannot be reproduced or continued.

In appearance, germinal matter is *often* structureless, especially as constituting the living moving matter of the protozoa or lowest animals of the rhizopod type, as the amœba. Yet it is not always structureless, but often *granular* in its appearance, and as constituting the mass of rapidly growing cells in health and disease, in the higher animals, is indeed *usually* granular, as is evident from the study of pus, or mucus, or white blood corpuscles, or the cells of a rapidly growing morbid growth. Indeed, it seems like sacrificing observation to theory, to say that germinal matter is always structureless. For let us take the white blood corpuscle or pus corpuscle, acknowledged to be pure germinal matter, and always described as granular in its structure; either the germinal matter here is granular, or the granules are particles of formed material or extraneous matter suspended in the formless substance, just as granular matter from without becomes entangled in the formless matter of the amœba. But, such a view as the latter, would be incompatible both with the behavior of growing germinal matter, and the reaction by which it is known; for we note, on the one hand, that when germinal matter grows rapidly, these granules are the elements which increase most abundantly; and again, that these are the portions most deeply stained by ammoniacal solutions of carmine or aqueous solutions of red aniline. Especially must this be the case if the so-called nuclei of these bodies, which appear after the addition of water and acetic acid, are simple aggregations of the granular matter, as is contended by Dr. Beale. We deem it incorrect, therefore, to describe germinal matter as in all instances structureless, and prefer, with Robin, to describe it as sometimes granular. Indeed, if we mistake not, Dr. Beale in his earlier descriptions also characterized it as granular.*

A circumscribed round or oval portion of germinal matter within the cell is usually termed the *nucleus*, which may be surrounded by formed material as in the superficial epithelial cell, or by other germinal matter as in the white blood corpuscle.

In the *nutrition* of the cell, the pabulum comes to it from the periphery; being strained through the formed material, and the new germinal matter takes its place in or near the centre of the original mass, constituting a new centre of germinal matter, which may be the

* Beale's Archives of Medicine, vol. ii, p. 189.

nucleus, if no other circumscribed centre be present, or the *nucleolus* if it be deposited within such a centre. Other new centres may again take position within these, and assume the relation of nucleolus to the original nucleolus, which now becomes a nucleus, an older centre of germinal matter; while the original nucleus has probably been converted into the second constituent of the cell, the formed material.

Germinal matter when free and living, exhibits a power of movement, both in *portions* of its substance, producing changes in shape, and in its *entire mass*, resulting in changes of position. The former, and probably, also, the latter, may have for their object the obtaining of pabulum, as is seen in the amœba, when it embraces by its protrusions a particle of nutritive matter. These movements are less decided in the cells of the higher animals, yet they are of constant occurrence, as in pus and white corpuscles, and when thus occurring they are spoken of as "amœboid movements." Allied or identical with this second class of movements, are those of undoubted occurrence, in which white blood corpuscles have been noted by Addison,* Waller,† and Cohnheim,‡ migrating from the blood-vessels, and constituting *one* method of origin of pus.

Formed Material, or Non-Germinal Matter.—As the result of influences, the exact nature of which is not known, though some of them may partake of the character of oxidations, the germinal matter is converted into the second constituent of the cell, *formed material.* This formed material, peripheral, for the most part in its situation, and constituting the cell wall when present, is without the property of germinating, or multiplying itself, or even maintaining itself. Yet it is exceedingly important, and as essential indeed to the functions of the economy, as the germinal matter. It is, in fact, the portion of the cell in which alone function resides, since it is to the formed material of the muscle-cell that we owe the property of contractility, to the formed material of the nervous element that we are indebted for neurility, and to the formed matter of the epithelial cell that we owe its protective qualities; while the secretion of all glands, whether they subserve ulterior purposes or not, is the formed material of the respective gland-cells. Hence, we would not in every instance speak of the formed material as dead, where it is the seat of so many important vital endowments, as in muscle and nerve. In some situations, it is indeed lifeless, as when it becomes the secretion of glands, as bile and milk, or the peripheral part of epithelial cells. It simply is devoid of a power of multiplying or growing by itself, depending for its increase upon the conversion of the germinal matter. Hence we have been inclined to suggest the term "non-germinal," or "non-germinating" matter, since this is the only attribute common to all formed material.

In *structure*, formed material or non-germinal matter is varied. Thus, it is typically without structure in the red blood disc; again, it exhibits distinctive structure in the striped sarcous matter of musele, and in the fibrous intercellular substance of white fibrous tissue or fibro-cartilage.

As formed material is produced on the periphery of germinal matter, previously existing formed material is pushed outward, so that the oldest formed material is that most remote from the germinal matter, and the youngest lies immediately adjacent to it.

Intercellular substance, whether of cartilage or white fibrous tissue, is formed material, resulting from the conversion of the germinal matter, which constitutes the cartilage corpuscle on the one hand, or the connective tissue corpuscle on the other. It is not of the nature of a deposit from the blood-vessels which subsequently becomes differentiated. Young cartilage cells, like all young cells, consist of almost pure germinal matter, and the capsule of the cartilage corpuscle is but formed material, more or less continuous and inseparable from the intercellular substance; so that we would, with Beale, define a cartilage cell, or elementary part of cartilage as composed of germinal matter, with as much surrounding formed material as extends half way to the adjacent germinal matter. So with the elementary part of connective tissue, muscle, and nerve.

Oil and starch are also formed matter, conveniently designated by Dr. Beale as *secondary* formed matter, and result, also, from a conversion of the germinal matter.

As already stated, the proportion in which these two constituents are present, is various. Thus, in the amœba, in the white blood disc, in the pus and mucous corpuscle, we have almost pure germinal matter, with a scarcely appreciable ring of formed matter on its periphery; while in the old epithelial cell we have almost pure formed material with a mere point of germinal matter, constituting the nucleus near its centre; and in the red blood disc, we have pure structureless formed matter, yet matter of which we should long hesitate to speak as dead. In old tendon, again, the proportion of formed material is large, and germinal matter small, while in young tendon the reverse proportion exists.

The *cell*, as thus constituted, and originating only in the germinal matter of a previously existing cell, we believe to be *the starting-point of all life action, be it healthy or morbid.* Out of this cell, all tissues, simple and complex, are constructed.

We believe, also, that the proper shaping, arrangement, and function of these elementary parts is not a process identical or analogous to crystallization, taking place through merely physical laws, but that there is a presiding agency which controls such arrangement to a definite end. It matters not what this is called, but we prefer to designate it at present by the term "vital force," or "vitality." It is this controlling agency which makes all so-called vital properties essentially different from purely physical properties, a difference which, though it be denied in *words*, and explained away by reasoning, has the most decided proof of its existence in the acknowledgment it receives in the *actions* of men, just as the most convincing argument in favor of the free agency of the human mind is seen in the fact, that all men shape their actions on the supposition of such a freedom, whatever their pretended belief with regard to it.

That there is something in this force or power over and above the physical forces of nature, is most strikingly shown in the power, exhibited through its agency by germinal matter, of multiplying and producing new germinal matter out of pabulum unlike itself. For although a crystal may result from the rearrangement of particles of a salt in solution, as sulphate of alumina, to an unlimited extent, there is no possibility, nor would any physicist contend

* Addison, Physiological Researches. London, 1841.
† Waller, London, Dublin and Edinburgh Philosophical Magazine, vol. xxix, p. 271, 1846.
‡ Cohnheim, Ueber Entzundung und Eiterung, Virch. Arch, Bd. xl, p. 48.

that it could produce crystals, of its own composition, out of carbonate of soda. Nor, as is justly contended by Dr. Beale, should the cell be compared to a machine, unless that machine possess a power of producing new machines out of material unlike itself, and of endowing them with a similar power.

In *morbid processes*, also, the germinal matter is the seat of activity, being abnormally increased, diminished, or perverted; and many pathological states are rationally explained by bearing in mind the properties of germinal matter and the very minute size which the living particles may exhibit. All physical difficulties in the way of the passage of white blood corpuscles through the walls of capillaries are removed, when we remember that the smallest living particles by the rapid growth of which white blood discs or pus corpuscles are speedily produced, do not exceed the 1-100000 of an inch in diameter, and that however unreasonable it may appear for a body 1-3000 of an inch in diameter to migrate through continuous capillary walls, it becomes much less unreasonable when we thus reduce its proportions. The observations of Beale would also seem to reconcile the discordant views with regard to the so-called *exudations*, in which on the one hand we need not suppose an excessive dislocation of structure to admit the passage of large cells, and on the other are not compelled to restrict the origin of those cells to points outside the vessels. We have already expressed that the views of H. Charlton Bastian and Cornil, with regard to the origin of tubercle in the perivascular sheaths of vessels, are not practically different from those earlier expressed by Beale as to its origin in the germinal matter of the walls of blood-vessels.

It will be noted that the only points of difference between our own and the views of Dr. Beale, lie in the *structure* of the germinal matter, and the use of the word *dead* to characterize formed material. In all other respects, we accept the theory of Beale, and have no hesitation in saying that it admits, without distortion of its own principle or disregard of actual facts, of consistent application to a larger number of processes of tissue-building in health and disease, than any other theory proposed.

In conclusion, then, it may be stated, 1st, that the "cell," or "elementary part," originating only in a pre-existing cell, is the ultimate morphological element of the tissue of animals and plants.

2d. That the cell, contrary to the belief of the earlier histologists, and, indeed, many later observers, is *rarely vesicular* in its structure, but generally more or less solid throughout.

3d. That the cell is composed of "germinal" or living matter which is central, and includes "nucleus," "endoplast," "protoplasm" and "sarcode;" and of "non-germinal," or "formed" matter, which is peripheral, and corresponds with "cell wall" and "intercellular substance."

4th. That this germinal matter of the cell in a part or all of its substance, may assume a special morphological state, usually round or oval, commonly known as the "nucleus" of the cell, which, when present, is always a young centre of germinal matter; but that in other instances both animal and vegetable cells may be complete without this special form of germinal matter or "nucleus," as in the non-nucleated amœbæ and protogenes primordialis of Hæckel, the non-nucleated monads of Cienkowsky, and in the leaf of Sphagnum, in such Algæ as Hydrodictyon, Vaucheria and Caulerpa, and in young germinating ferns.

5th. That in consequence of these facts, it cannot be said that in the nucleus alone resides the power to reproduce the cell, since we find the nucleus not essential, but that in the germinal matter, of which, after all, the nucleus, when present, is but a part, resides this function.

6th. That when the smaller body within the nucleus, usually known as the "nucleolus," is present, as it often is in complete cells, it is simply a younger centre of germinal matter than is the nucleus itself, and is the last formed portion of germinal matter, instead of being the oldest part of the cell, as originally taught by Schleiden and Schwann. And thus, according to the latest views, the whole process is reversed. The old order of succession being, 1st. The "nucleolus;" 2d. About this the "nucleus;" and finally about this the "cell wall," which embraces the cell contents. Now, however, what constitutes the "cell wall" when present, is the oldest part of the cell; next in age are the so-called "cell contents," whether germinal matter or not; next the "nucleus," and last and youngest the "nucleolus."

7th. That the formed material constituting the cell wall and intercellular substance may be something chemically different from the germinal matter, or protoplasm whence it was converted, as the secretions of gland-cells, or may be a simple condensation of the exterior of the cell, as in the red blood disc.

8th. That the so-called "free nuclei," so often referred to by pathologists in their descriptions of minute structures, are simply masses of germinal matter, smaller than those to which the name cell is usually given, which, if time be permitted, will pass into perfect cells by the usual production of formed matter on their periphery: that they do not originate spontaneously, but from previously existing germinal matter. So, too, "granules," if they be composed of germinal matter, present the same attributes and endowments, arising from previously existing germinal matter. capable of growing, multiplying, and assuming all the characters of fully formed cells, but never originating spontaneously. Granules otherwise composed are *histolytic* and *not histogenetic*,—that is, they result from the breaking down of tissue rather than go to building it up.

The work is handsomely illustrated, with a colored plate illustrative of Dr. Beale's views, and numerous illustrations. The typography and appearance of the work reflect credit upon the publishers. We heartily commend it to the medical and dental public.

Transactions of the American Dental Association. Ninth Annual Meeting, August 3 to 6, inclusive, 1869.

The committee in charge of the publication of the transactions deserve credit for the promptness and good style which the work presents; besides the minutes of the meeting, it contains valuable essays and reports, by Drs. Atkinson, Ambler, Butler, Allen, Palmer and Dean. The discussions, ably reported by Dr. W. C. Horne, are full of instruction. The interest manifested in the subjects considered is an evidence of dental progress. It is on sale at the different dental depots.

On the Relations which Dental Caries (as Discovered Amongst the Ancient Inhabitants of Britain, and amongst Existing Aboriginal Races,) may be supposed to hold to their Food and Social Condition. By JOHN R. MUMMERY, F. L. S., L. D. S., Vice-President of the Odontological Society of Great Britain.

This little work was received too late for review, but from a hasty perusal of its contents the author would seem to have presented an exhaustive treatise on the subject considered. G. T. B.

Selections.

We think the following equal to the best efforts of "Fanny Fern."

G. T. B.

IN THE DENTIST'S CHAIR.

BY "ONE WHO HAS BEEN THERE."

If there is any place which, more than another, shows what people are made of, it is this particular one. We flatter ourselves that we are made of "sterner stuff" than to shrink at any misfortune; but, alas, we find that so far from having any back-bone, "we are such stuff as dreams are made of, and our little life is rounded"—no, jagged, by the *toothache.*

These are the times that try men's souls, aye, and women's too, tries them and finds them wanting; shows us so plainly, that a wayfaring man, though a fool, need not err therein, the world-wide difference between actual and imaginary bravery.

Where is that heroic courage, which we fancy ourselves to possess, as we follow some hero through deeds of daring? Fired with enthusiasm, we picture ourselves standing on picket duty in the midnight gloom of a forest, or rushing to the "imminent deadly breach." It is sweet to die in a noble cause, and we see ourselves falling with dignity, amid the tears of our admiring and bereaved friends.

But let this lofty soul feel the tingling of a little, miserable, comtemptible bit of an end of a tangle of sensation, called a nerve—a bit not more than a half inch long, and say a hair's breadth in thickness—and how it does take the nonsense out of one. Brave! Of course I'm brave, if I'm not going to be hurt. Fortitude! I've as much as other people if there's nothing to bear. Why I have stood and looked on with perfect

composure while my dearest friends have had their teeth pulled; but it does make all the difference in the world as to which is getting hurt.

But you screw up that most slippery article, your courage, till you think you have it at the sticking place. For weeks you say to yourself, "Well, I really ought to go to the dentist's." Then your virtuous resolution rises a notch higher, and you determine to go; and you hug yourself in admiration of so much bravery and don't go, satisfied to let the matter rest there till some worse twinge than ordinary carries you bodily to the office, and there you are, fairly in his clutches, and not to be released till you have paid to the uttermost in suffering.

Such is the hardness of the human heart, that the dentist actually meets you smiling, he will rub his hands and say, "It's a fine morning," or some other heedless speech. Dentists ought to be reformed. They should be solemn and sympathizing as undertakers. Hung be the heavens with black, when I am compelled to approach their hearts, and I would have them attired in funereal suits; let them also have a white handkerchief with a deep border, (possibly, mourning on the edge,) visible from the pocket, and let them pull it out and drop a tear or two when their patient's sufferings become too affecting. But as the world is now, we have mourned unto them and they have *not lamented.* They smile at your agony and have you into the chair. There you are, and your soul sinks into your very boot-heels. You desire to retain some vestige of self-respect, and your friends have thought you to possess a strong will, otherwise, no power on earth would make you open your mouth.

It is a startling fact, that pain hurts every single, solitary human being in this world, more than it does any other human being, and by consequence, it hurts you worse than any other. Your teeth are twice as sensitive as anybody else's; the nerve is particularly touchy; nay, the very roots grow round the jaw, so that it is impossible almost to pull them. "*Hinc illæ lachrymæ.*"

Then the dentist begins. He has to ascertain how badly he can hurt you with impunity. You clutch the chair apprehensively, with every muscle and nerve in your body at full tension, while he pokes and cuts around. You are about settling down that it is not so bad as you had feared, your nerves relax, and you think possibly there may be a man of feeling in the profession, when, in a second, he *feels* for you, and finds you, too. You are pierced to the very soul; exquisite pain seems to dart to the roots of your being. The tears come, and when you are sufficiently recovered to look about, your dentist remarks, in the most commonplace manner, "I thought so—nerve's exposed." Then doth he set himself with so much cunning and malace to kill the nerve. He actually lays his sacrilegious hand on the infinitely fine cobweb of a telegraph, by which communication is carried on in your system, and destroys one of the outposts of sensation. In the meantime you muse whether it is right thus to destroy what seems such a particularly near part of yourself. But reflecting what a rebellious member it has been, the nights you have sat up to experience all it could bring to bear upon you, you decide to let it go.

But not a thought of hesitation has filled your dentist's mind, and with a little medicine, which seems to turn your head round and round, and your tooth inside out, and bore into its very roots, he lets you go. A sadder and a wiser woman you arise, with the distinct consciousness that

your dentist thinks you a very weak sister, not half so strong to endure as Miss So-and-so, who could sit down any morning and have half the teeth in her head pulled out, and never whimper. Not only are you mortified for yourself, but because you have brought shame on your half of the human race. Women are such cry-babies, and you who were thought strong-minded are among the worst.

But on inquiring, I hope you will meet the same delightful response that I did from a dentist, whom I have ever after considered a gentleman and a scholar. Thus it was: "Women bear pain a great deal better than men." Comforted not a little by this reflection you leave the office, saying, like the silly fly of our childhood:

"And bidding you good morning now, I'll call another day,"

but mentally resolving never to visit that scene again. But soon, alas, this silly little fly comes slowly, unwillingly creeping back, finds itself "within the little parlor," and "in the little den," taking another turn with the tooth.

Oh! the cruel uncertainty of not knowing whether it will hurt, or what the dentist is doing, and the delight of finding the nerve dead. The communication is cut, and you are happy.

Now let the dentist do his worst. He may dig, and cut, and file, and drill, and mallet, and what care you? You sit in bliss, and retire elated. Next to the satisfaction of a good conscience is that of a good plug in the tooth. You relax the severity of your former judgments. A dentist is undoubtedly a "man and a brother." You shake hands without a spark of malice in your soul. Let us hope that you place the fee promptly in his possession, think of him gratefully, and spread the praises of his skill, consideration and faithfulness wherever you have opportunity.—*Missouri Dental Journal.*

ARTICULATION.

BY W. H. THRIFT, D. D. S.

I have ventured to imagine, I may contribute a short article to the *Register*, that may not be entirely without interest to at least some of your readers.

The manner in which I obtain an articulation in full sets of teeth, is as follows: Over the plaster impressions mould temporary plates made of gutta percha, when cool, trim to suit case, using care that the plates do not interfere with the action of any muscles brought in contact with them, while in the mouth. Now select the teeth to be used in the case, and place the plates in the mouth, with incisor and molar sections temporarily fastened to them. Change the teeth if necessary in getting right articulation; take a strip of wax, warm it first over a spirit lamp, and fasten the two plates together by pressing the wax between incisor and molar sections; after giving the wax time to harden, remove the plates from the mouth together and plaster them on the articulator, not using plaster casts. After the teeth have been ground and arranged to suit, try them in the mouth, and if not right, make the necessary changes before discharging patient.

I claim the following advantages over the old practice, viz: time is saved, and it does away with the danger of marring impressions while grinding and arranging the teeth. It has been my experience that a more accurate articulation is obtained by this method than any other with which I am familiar.—*Dental Register.*

FILLING OVER EXPOSED PULPS, HOW TO DO IT SUCCESSFULLY.

BY G. C. DABOLL, BUFFALO.

A little consideration of the form and nature of the dental pulp may help us to an intelligent appreciation of the kind of treatment it will endure successfully; for, if knocked about the right way, and with the proper materials, the pulp will endure a good deal of professional banging. The pulp cavity in shape corresponds to that of the tooth to which it belongs. The pulp has the same form, and, according to Mr. Thomas Bell, is a very soft, gelatinous, semi-transparent body, having its surface covered by an extremely delicate, thin, vascular membrane, closely attached to it by vessels. The arteries which supply the pulp enter the tooth at the apex of its root, and throw around it a network of circulation, indicating the great vascularity of this tissue. The larger arteries are deep, and communicate with the veins on the surface by great numbers of looped capillaries. The nerves of the pulp come from the superior and inferior maxillary divisions of the fifth, and are seen to form a series of loops.

From the foregoing description, it will be seen that the pulp seems to be constituted of blood-vessels and nerves, enveloped by a very delicate membrane, and blood-vessels, nerves and membrane are in turn confined in the centre of the hard and unyielding substance of the tooth, which, in the event of any disease of the organ in question, serves to complicate the difficulties, and render the more doubtful any treatment, with a view toward the restoration to health. Now a healthy pulp and a diseased one, when we are treating cases of exposure, are two entirely different things, and the careful operator, on having a case presented for his consideration, will, as a fundamental rule, ascertain which he has to deal with; for, with the primary treatment, rests, in a great measure, the final success of the operation. If the pulp is exposed by carelessness in excavating, in a tooth that has never given any trouble to the patient beyond mere sensitiveness, we have a very simple diagnosis. From the description we have had of the pulp, we know that the mere wounding of a vein is exposure, and must be treated as such. If the patient presents a tooth, in the cavity of which, on clearing away the debris, we can distinctly see the pulsation of the arteries, we have a different condition of things, with an equally simple diagnosis. Then we have cases of semi-exposed pulps, that is, with only the slightest possible covering of softened dentine, that separates this mass of blood-vessels and nerves from the air. These come under the head of exposed pulps, and of this condition we meet more than of any other, the treatment of which are as important, and require as much skill as any. Now, we hold that the dental pulp is subject to the same law of health and disease that governs the flesh only to a certain degree, and that only so far as it harmonizes with its more delicate and sensitive nature. Because a wound in the arm or any other portion of the system heals by first intention, it does not necessarily follow that a wound in the dental pulp will do the same. A wounded vein of the pulp will close its walls the same as any other vein in the system, and if protected from irritating agents, will heal as perfectly; but if one of the nerves of the pulp is severed, or an artery ruptured, we very soon comprehend the distinction by the result. A pulp that has once been thoroughly congested, will surely die, and although we may treat it in this condition, it will be of little avail as regards its salvation. We entirely disagree with one of the luminaries of our profession, who claims to believe

that a pulp may be saved, even after ulcers have formed on its surface. The solid walls that protect it in a state of health, in its diseased condition, by confining and restricting its limits, insure its destruction. The mass of arteries, veins and nerves take on an inflamed condition, each separate nerve and blood-vessel swells to its utmost limit, and is pressed and jammed into its neighbor, until a partial or complete state of disintegration, which is synonymous with suppuration, takes place. We all know what an aggravation a ligature or tight bandage is to an inflamed limb, and that is precisely what the tooth is to the inflamed pulp. We must deal with the pulp before it reaches congestion, and therein lies our province as saviors; an irritation or inflammation can be met and subdued, a wounded vein may be healed; but beyond the primary or medium stages, very little can be accomplished.

With the primary treatment of the exposed or inflamed pulp, we come to the consideration of materials for filling, and appreciating the delicate nature of that organ, we must necessarily choose delicate substances, and those that can be adapted or will adapt themselves most perfectly and readily to the diseased surfaces, with the least irritation, and by the application of the least force. For this purpose, we have as yet found nothing superior to Hill's stopping and oxy-chloride of zinc. Each has its peculiar merits, and in special conditions there is a choice in their use. Hill's preparation being a non-conductor, effectually protects the pulp from thermal influences, and in cases of semi-exposure is, in our opinion, to be preferred for temporary fillings. For a wounded vein, or other exposure, the oxy-chloride is far preferable. This can be adapted absolutely without the exertion of any pressure, thereby avoiding one of the principal dangers of the treatment.

If we have a wounded vein, and there has been no previous irritation, as soon as the bleeding ceases and the cavity rinsed with warm water, we apply a little creasote from a pellet of cotton, just enough to moisten the parts immediately over and adjacent to the exposed place, and then fill with zinc. As soon as it is hard, say from ten to fifteen minutes, cut away, leaving enough in the bottom of the cavity to protect it, and fill the balance with gold. If done carefully and thoroughly under these conditions, a failure will be of rare occurrence. In cases of semi-exposure, we rarely meet with one that has not been subject to more or less irritation, and there is very likely to be some lingering inflammation or morbid condition, that must be corrected. These are the instances in which the patient has had a little pain, more or less severe, continuing for an hour or two sometimes, or again only a few minutes, owing to some thermal shock or sudden pressure. These we treat with creasote or carbolic acid, placing it in the cavity on a pledget of cotton, and sealing it with cotton and sandarac. Repeat two or three times at intervals of thirty-six or forty-eight hours, and then fill the cavity with Hill's stopping. This will protect it entirely from thermal changes, and may be left in from four to six weeks, when, if there has been no trouble, remove the filling, and refill partially with zinc and cap with gold. If the tooth will indure the perfect sealing with the gutta percha for a month or six weeks, we regard it as evidence, in ordinary cases, of the health of the pulp. We leave them longer if there is any doubt, or if the case is a bad one, for time is the test. Two or three months in the worst conditions at the farthest, with careful manipulation, will insure nineteen cases out of twenty.

A pulp exposed by the natural decay of the tooth, and that has a portion of its surface entirely denuded, is a dainty subject to deal with. Before it has arrived at this condition, it has passed through many tribulations, and only escaped congestion by some rare and happy combination of circumstances. There has been, of course, some inflammation, the result of numberless thermal shocks, if nothing more, and this adds to its natural sensibility a morbid condition that complicates the case excessively. Our first step is to be assured of the absence of congestion; and one of the most reliable indications to our mind, is the vitality of the nerve filaments in tubuli, and a partial excavation will soon satisfy us. This, with the knowledge we can get on the subject as to the amount and character of pain experienced at different times, will give us a tolerably accurate diagnosis. Having removed as much of the decay as possible, we lay a pledget of cotton, saturated with creasote, directly over the part exposed, and seal loosely with sandarac and cotton, great care being exercised that there shall be no pressure. After one or two treatments fill the cavity with zinc. If all right, the pain caused by the filling will pass off in from two to six hours. If subsequently the tooth is very sensitive to heat and cold, cut away a portion of the filling, and cap with Hill's stopping. Such cases as these we leave for three months, then remove the filling, and ascertain the condition of the pulp; if we find it alive, refill with zinc and cap with gold. We have had a few cases in which the nerve died, the creasote neutralizing the gases, and the tooth giving no trouble up to the time it was examined; but these are rare, and it will be found that inflammation will supervene in a short time after the temporary filling has been introduced, if everything is not all right. When there has been but very little previous irritation, we do not stop to treat with antiseptics, but moisten the cavity with creasote or carbolic acid, and fill immediately with zinc. In numbers of cases where the tooth has been presented in an aching condition, it being the first instance, we have treated and filled with perfect success.

We do not claim infallibility, but give this as our mode of treatment, from which the percentage of failures has been so small that we feel justified in claiming for it the careful consideration of every man that is not already practicing it. We can save teeth by extirpating the pulps, and if it comes to the worst it is beyond a doubt a great blessing; but as compared with the salvation of the pulp and restoring the organ to its normal condition of health and usefulness, it is not a question for argument. —*Canada Journal of Dental Science.*

Cancer of the Breast.—An Italian medical journal recommends the following as an application in cancer of the breast: Concentrated acetic acid, 15 parts; creasote, 3½ parts; water, 450 parts. A case is mentioned in which a cancer was removed and cicatrization completed in six weeks. The application was made on charpie, four or five times daily.

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E. WILDMAN, M. D., D. D. S.,
PROFESSOR OF MECHANICAL DENTISTRY AND METALLURGY.

G. T. BARKER, D. D. S.,
PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS.

JAMES TRUMAN, D. D. S.,
PROFESSOR OF DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

JAMES TYSON, M. D.,
PROFESSOR OF PHYSIOLOGY.

E. R. PETTIT, D. D. S.,
DEMONSTRATOR OF OPERATIVE DENTISTRY.

J. M. BARSTOW, D. D. S.,
DEMONSTRATOR OF MECHANICAL DENTISTRY.

J. EWING MEARS, M. D.,
PROFESSOR OF ANATOMY AND SURGERY.

T. L. BUCKINGHAM, Dean,
1206 *Vine Street.*

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Fourteenth Annual Session, 1869-'70.

Preliminary Lectures and Instructions.—The Dispensary and Laboratory of the College will be opened on the 1st of September, where ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability; and during October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday in November, and continue until the first o March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation, and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

ANATOMY AND SURGERY.

The instruction in this department will embrace a plain and comprehensive view of the structure of the human body. The lectures and the demonstrations will be given over *the dead body dissected for the express purpose* of elucidating the subject. With the same object, vivisections on the lower animals, while under the influence of an Anæsthetic Agent, will be employed.. Such description of the comparative anatomy, microscopical structure and connections of the teeth, as their importance may demand, will be fully given. The valuable and extensive collections of Anatomical Preparations of the incumbent of this chair, consisting of wet and dried specimens, papier mache manikins, models in wood, and accurate French plates, will enable him to illustrate his course of lectures very clearly.

In addition to the above course, a Surgical Clinic will be held by Doctor Forbes during every week, for the purpose of performing such operations in oral and general Surgery as may be deemed advisable to advance the student in this particular branch of knowledge. The cases will be selected from a dispensary which the Faculty have established.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical pecularities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

CLINICAL INSTRUCTIONS.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the demonstrators.

In the Operative Department.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

In the Mechanical Department.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

Practical Anatomy.—The great facilities for the study of practical anatomy to be found in Philadelphia, in several well ordered and supplied dissecting rooms, present to the student advantages for its prosecution superior to those offered in any other city.

Hospital Clinics.—In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of dentistry, the celebrated hospitals and clinics of the city constantly enable the students to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Pennsylvania and Philadelphia Hospitals, two of the largest eleemosynary establishments in the world, are open to medical and dental students, free of charge.

FEES.

Matriculation, (paid but once,) - - - - - - - - -	$5 00
For the Course, (Demonstrator's ticket included,) - - - - -	100 00
Diploma, - - - - - - - - - - - - -	30 00

TEXT BOOKS AND WORKS OF REFERENCE.

Leidy's or Gray's Anatomy; Carpenter's or Kirk's Physiology; United States Dispensatory; Pereira's, Biddle's or Stille's Therapeutics; Fownes' Elements of Chemistry; Regnault's Chemistry; Lehmann's Physiological Chemistry; Hartshorne's Principles and Practice of Medicine; Wood's Practice; Tomes' Dental Physiology and Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Wildman's Instructions in Vulcanite Work; Barker on Nitrous Oxide; Gross' or Erichsen's System of Surgery; Paget's Surgical Pathology, or other standard works on the subject.

QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupilage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before

the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

CANDIDATES FOR GRADUATION WHO HAVE NOT ATTENDED LECTURES.—Dentists who have been in continued practice since 1852, are eligible to be candidates for graduation without attendance on lectures. The candidate for graduation must present satisfactory evidence of his having been in practice for the allotted time, also of his good standing in the profession. He must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must present specimens of his workmanship. He must undergo a satisfactory examination by the Faculty, on each of the branches taught by them; when, if qualified, he shall be recommended to the Board of Trustees, and if approved, shall receive the degree of Doctor of Dental Surgery. Of this class of graduates, the matriculation and diploma fees only are required.

For further information, address

T. L. BUCKINGHAM, Dean,
No. 1206 Vine Street, Philadelphia.

BOARD can be obtained at from $4.00 to $8.00 per week.

ALL THE INSTRUMENTS AND TOOLS required can be procured for from $15.00 to $20.00.